Application No. _____

Exhibit No. _____

Date _____

Witness _____

BEFORE THE

PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

GOLDEN STATE WATER COMPANY

PREPARED TESTIMONY OF ELIZABETH V. MCDONOUGH DANE T. SINAGRA

Operating District Construction Work in Progress

Volume 3 of 3

Attachments P – W

Prepared by:
GOLDEN STATE WATER COMPANY
630 East Foothill Boulevard
P. O. Box 9016
San Dimas, CA 91773-9016

July 2020

ATTACHMENT P

Date (s) of notification	Description
2018	
10/14- 10/16	potential shutdown and remove (does not mention specific area)
11/7-11/8	potential shutdown and remove (does not mention specific area)
12/30 - 1/1/2019	potential shutdown and remove (does not mention specific area)
2019	
06/19-06/22	potential shutdown and remove(lucerne)
07/01-07/04	potential shutdown and remove (morongo)
07/15-07/17	potential shutdown and remove (morongo)
09/07-09/08	potential shutdown and remove (lucerne)
09/13-09/19	potential shutdown (lucerne), removed on 09/19
24-Sep	potential shutdown (wrightwood and lucerne)
25-Sep	remove wrightwood and lucerne
7-Oct	PGE potential shutdown email notification
8-Oct	PG&E first phone notification for Clearlake
10/9-10/11	Power shutdown in Clearlake. Bay Point on List
10-Oct	potential shutdown (Simi, Morongo, Lucerne and Cowen-Lemon Heights)
10/11-10/13	Remove Cowen-Lemon Heights and Morongo, Lucerne
10/15-10/20	potential shutdown Lucerne and simi removed
21-Oct	potential shuttown (Clearlake)
10/22- 10/31	potential shutdown (Simi, Cowen-Lemon Heights, Morongo, Lucerne)
10/25-10/26	Potential shutdown (Clearlake)
10/28-10/30	PGE Potential shutdown (does not mention specific area)
26-Oct	PGE notification power shutdown may occur
10/26-10/30	Power Shutdown in Clearlake
10/28-10/31	Power was shutdown at Simi
31-Oct	removed from PSPS - Cowen-Lemon Heights, Morongo, Simi
31-Oct	Power was restored at Simi
11/17-11/19	Potential PSPS notifications for Clearlake
20-Nov	Power shut down in Clearlake. Power down in CSA

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 1:51 PM
To: SCEoutage
Cc: Pegg, Pamela J.; Pierotti, Jon
Subject: FW: This is an important public safety (PSPS) message from Southern California Edison

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Wednesday, September 25, 2019 1:42 PM
To: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to current conditions, your area has been removed from Public Safety Power Shutoff consideration, and no electric service will be proactively turned off at this time. If outages due to other reasons unrelated to Public Safety Power Shutoffs occur in your area, SCE will work as quickly as possible to restore your service. For more information please visit our website at www.sce.com. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

The following address(es) are no longer in areas being monitored:

1500 STATE HIGHWAY-2 2
WRIGHTWOOD, CA 92397
Service Account: 3-XXX-XX75-45
Meter: 222011-964303
Rate: DOMESTIC

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 1:51 PM
To: SCEoutage
Cc: Pegg, Pamela J.; Pierotti, Jon
Subject: FW: This is an important public safety (PSPS) message from Southern California Edison

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Wednesday, September 25, 2019 12:57 PM
To: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to current conditions, your area has been removed from Public Safety Power Shutoff consideration, and no electric service will be proactively turned off at this time. If outages due to other reasons unrelated to Public Safety Power Shutoffs occur in your area, SCE will work as quickly as possible to restore your service. For more information please visit our website at www.sce.com. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

The following address(es) are no longer in areas being monitored:

204 PLANT K6
MORONGO VALLEY, CA 92256
Service Account: 3-XXX-XX70-29
Meter: 222013-781250
Rate: TOU-GS1E

6184 CARDINAL RD
WRIGHTWOOD, CA 92397
Service Account: 3-XXX-XX48-80
Meter: 256000-052626
Rate: TOU-PA2E

6313 CARDINAL
WRIGHTWOOD, CA 92397
Service Account: 3-XXX-XX68-58
Meter: 256000-133268
Rate: TOU-GS1E

9345 BELLA VISTA DR
MORONGO VALLEY, CA 92256
Service Account: 3-XXX-XX74-89
Meter: 256000-117454
Rate: TOU-PA2E

9446 SUNDOWN TRL
MORONGO VALLEY, CA 92256
Service Account: 3-XXX-XX69-66
Meter: 256000-217561
Rate: TOU-GS1E

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:07 AM
To: Pegg, Pamela J.
Subject: FW: SCE Safety Alert: Public Safety Power Shutoff (PSPS)

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Bell, Tyson
Sent: Tuesday, September 24, 2019 1:41 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>; SCEoutage <SCEoutage@gswater.com>; Cowen, Jim L. <JLCOWEN@gswater.com>; Marconi, Paul <Paul.Marconi@bves.com>
Subject: RE: SCE Safety Alert: Public Safety Power Shutoff (PSPS)

Thank you

From: Tejada, Karla <Karla.Tejada@gswater.com>
Sent: Tuesday, September 24, 2019 11:53 AM
To: SCEoutage <SCEoutage@gswater.com>; Bell, Tyson <Tyson.Bell@gswater.com>; Cowen, Jim L. <JLCOWEN@gswater.com>; Marconi, Paul <Paul.Marconi@bves.com>
Subject: Fwd: SCE Safety Alert: Public Safety Power Shutoff (PSPS)

Make note, Tyson and Jim. Affecting your facilities/plant sites.

Begin forwarded message:

> **From:** Southern California Edison <do_not_reply@scewebservices.com>
> **Date:** September 24, 2019 at 11:44:36 AM PDT
> **To:** karla.tejada@gswater.com
> **Subject: SCE Safety Alert: Public Safety Power Shutoff (PSPS)**
>
> EXTERNAL EMAIL

Manage your account online.

Due to forecast fire weather conditions, Southern California Edison is exploring a potential Public Safety Power Shutoff of electrical lines in your area. These conditions may result in SCE turning off your power. SCE anticipates that this may occur on Tuesday, September 24th though it may occur earlier or later depending on actual weather conditions. We encourage you to prepare by having an outage plan and emergency kit. SCE will send daily updates until conditions improve.

The following address(es) are within areas being monitored:

1500 STATE HIGHWAY-2 2
WRIGHTWOOD, CA 92397
Service Account: 3-XXX-XX75-45
Meter: 222011-964303
Rate: DOMESTIC

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

6184 CARDINAL RD
WRIGHTWOOD, CA 92397
Service Account: 3-XXX-XX48-80
Meter: 256000-052626
Rate: TOU-PA2E

6313 CARDINAL
WRIGHTWOOD, CA 92397
Service Account: 3-XXX-XX68-58

Meter: 256000-133268
Rate: TOU-GS1E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

For more info such as expected duration: please visit www.sce.com/psps.
Downed power line? Stay away, Call 911, and SCE at 1-800-611-1911.

Thank You,

Southern California Edison

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:07 AM
To: Pegg, Pamela J.
Subject: FW: Golden State Water - Updated PSPS Circuit Lists 9-24-19
Attachments: Golden State Water SA by Circuits_PSPS 92419.xlsx

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: James Pasmore <James.Pasmore@sce.com>
Sent: Tuesday, September 24, 2019 12:08 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: Golden State Water - Updated PSPS Circuit Lists 9-24-19

EXTERNAL EMAIL
Karla, Brandyn:

Good afternoon. Please see updated circuit list for ALL Golden State Water accounts currently in scope. Earlier this morning the SKY HI circuit was added based on high wind forecasts and is an area of concern for potential PSPS activity today between 12:00 and 15:00.

The attached list has all accounts including those associated with SKY HI.

Please let me know if you have any questions or concerns.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

SOUTHERN CALIFORNIA EDISON | Energy for What's Ahead™
www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

Account Manager Name	Top Customer Name	Top Customer Number	ustomer Nar	ustomer N	Serv Acct Number	SA Name	Meter (1-5)	Cust Acct Number
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	7029	DELNRTE 358.8031-NRDGE A&B BST	222013-781250	24191967
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	1157022		222014-051370	24376279
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	6963	V. 367.8031-SUTTER 1	256000-087471	4448718
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	7023	V. 367.8031-TOPAZ 1	256000-056098	4448718
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	6966	DEL NORTE 358.8031-HIGHWAY 2	256000-217561	24191967
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	6960	V. 367.8031-MEB 11/A BSTR	256000-020397	4448718
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	31087489	DEL NORTE BELLA VISTA 358.8031	256000-117454	24191967
James Pasmore Jr	AMERICAN STATES WATER COMPANY	5514190	GOLDEN ST	2502	32524252	367-8031	256000-138980	4448718

Rate	Serv Acct Address	Serv Acct City	Zip	County Name	Main Contact Name	Contact Phone	Contact Mobile	Contact Email	Circuit	HFA	Substation
TOU-GS1E	204 Plant K6	Morongo Valley	92256	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	OKAPOO TR	Y	Yucca
TOU-GS1E	2300 Radford Camp Road	Angelus Oaks	92305	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	JENKS LAKE	Y	Converse Flats
TOU-GS1E	2405 Plant M-6	Lucerne Valley	92356	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	SKY HI	Y	Lucerne
TOU-PA2E	2446 Plant L-9	Lucerne Valley	92356	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	SKY HI	Y	Lucerne
TOU-GS1E	9446 Sundown Trl	Morongo Valley	92256	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	OKAPOO TR	Y	Yucca
TOU-PA2D	8726 Mesa Rd	Lucerne Valley	92356	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	SKY HI	Y	Lucerne
TOU-PA2E	9345 Bella Vista Dr	Morongo Valley	92256	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	OKAPOO TR	Y	Yucca
TOU-PA2E	32172 Silver Creek	Lucerne Valley	92356	San Bernardino, County Of	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com	SKY HI	Y	Lucerne

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:07 AM
To: Pegg, Pamela J.
Subject: FW: This is an important public safety (PSPS) message from Southern California Edison - Update 9/23/19 @ 1410PM

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: James Pasmore <James.Pasmore@sce.com>
Sent: Monday, September 23, 2019 2:11 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: This is an important public safety (PSPS) message from Southern California Edison - Update 9/23/19 @ 1410PM

EXTERNAL EMAIL
Karla, Brandyn:

Good afternoon. SCE is continuing to monitor developing weather conditions in the Fontana region for a possible PSPS event in the next 24 hours. Please let me know if have any questions or concerns.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Southern California Edison [mailto:do_not_reply@scewebservices.com]
Sent: Monday, September 23, 2019 12:37 PM
To: James Pasmore <James.Pasmore@sce.com>
Subject: (External):This is an important public safety (PSPS) message from Southern California Edison

Manage your account online.

Due to forecast fire weather conditions, Southern California Edison is exploring a potential Public Safety Power Shutoff of electrical lines in your area. These conditions may result in SCE turning off your power. SCE anticipates that this may occur on Tuesday, September 24th though it may occur earlier or later depending on actual weather conditions. We encourage you to prepare by having an outage plan and emergency kit. SCE will send daily updates until conditions improve.

The following address(es) are within areas being monitored:

204 PLANT K6
MORONGO VALLEY, CA 92256
Service Account: 3-XXX-XX70-29
Meter: 222013-781250
Rate: TOU-GS1E

9345 BELLA VISTA DR
MORONGO VALLEY, CA 92256
Service Account: 3-XXX-XX74-89
Meter: 256000-117454
Rate: TOU-PA2E

9446 SUNDOWN TRL
MORONGO VALLEY, CA 92256
Service Account: 3-XXX-XX69-66
Meter: 256000-217561
Rate: TOU-GS1E

For more info such as expected duration: please visit www.sce.com/psps.
Downed power line? Stay away, Call 911, and SCE at 1-800-611-1911.

Thank You,

Southern California Edison

Privacy Notice

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: SCE Public Safety Power Shutoff (PSPS) Update - ALL CIRCUITS CLEARED

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: James Pasmore <James.Pasmore@sce.com>
Sent: Friday, September 20, 2019 7:05 AM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: SCE Public Safety Power Shutoff (PSPS) Update - ALL CIRCUITS CLEARED

Good morning:

I received word that SCE has demobilized our Incident Management Team last evening. There are currently NO circuits being monitored or under potential threat of further PSPS activity. Weather conditions and forecast show that we should be clear through the weekend.

Please let me know if you have any questions.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: James Pasmore
Sent: Tuesday, September 17, 2019 2:40 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):RE: (External):Fwd: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

Karla,

Good afternoon. We continue to be in a holding pattern and accounts on the Sky Hi circuit are still potentially in scope for possible PSPS actions over the next 24 hours. This happens when conditions remain essentially stable, meaning that there are enough factors present to place the circuit on a watch list, but those conditions don't change significantly enough to warrant either removing it from the list, or taking further action toward de-energization.

Please let me know if you have any other questions.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Tejada, Karla [mailto:Karla.Tejada@gswater.com]
Sent: Tuesday, September 17, 2019 8:44 AM
To: James Pasmore <James.Pasmore@sce.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: (External):RE: (External):Fwd: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

Hi James,
Do we have any updates?

Karla

From: James Pasmore <James.Pasmore@sce.com>
Sent: Monday, September 16, 2019 9:35 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Subject: Re: (External):Fwd: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

Karla,

It means there a potential for a PSPS event in the next 24 hours if weather and other conditions continue. If that is the case, we would provide another notification shortly before we would de-energize the circuit in question, then continue to provide updates as we monitor and determine when conditions are safe to restore power.

Please let me know if you have any other questions. Thank you.

James

Sent from my iPhone

On Sep 16, 2019, at 8:21 PM, Tejada, Karla <Karla.Tejada@gswater.com> wrote:

James, what does 1 day notification mean?

Begin forwarded message:

From: Southern California Edison <do_not_reply@scewebservices.com>
Date: September 16, 2019 at 7:46:18 PM PDT
To: karla.tejada@gswater.com
Subject: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

EXTERNAL EMAIL

Manage your account online.

SCE continues to explore options for a potential Public Safety Power Shutoff (PSPS) in your area. No power has been shut off at this time. We are identifying circuits in that area that might be affected by dangerous high winds in high fire risk areas, and continue outreach to local officials and customers in advance of a potential decision to shut off power. Please be prepared with your personal emergency plan.

The following address(es) are within areas being monitored:

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52

Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

SCE will send daily updates until conditions improve. For more information, please visit sce.com/psps. Downed power line? Stay away, call 911, and SCE at 1-800-611-1911.

Thank you,

Southern California Edison

Privacy Notice

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Thursday, September 19, 2019 5:04 PM
To: Hancocks, Brandyn
Subject: SCE Safety Alert: Public Safety Power Shutoff (PSPS) Avoided Shutoff Notice

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to improved fire weather conditions, your area has been removed from Public Safety Power Shutoff consideration. No electric service will be proactively turned off at this time. If a non-PSPS outage occurs, SCE will work as quickly as possible to restore your service.

The following address(es) have been removed:

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

For more information please visit our website at www.sce.com/psps. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

Thank You,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Wednesday, September 18, 2019 6:54 PM
To: Hancocks, Brandyn
Subject: SCE Safety Alert: Public Safety Power Shutoff (PSPS) Update Notification

EXTERNAL EMAIL

Manage your account online.

SCE continues to explore options for a potential Public Safety Power Shutoff (PSPS) in your area. No power has been shut off at this time. We are identifying circuits in that area that might be affected by dangerous high winds in high fire risk areas, and continue outreach to local officials and customers in advance of a potential decision to shut off power. Please be prepared with your personal emergency plan.

The following address(es) are within areas being monitored:

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60

Meter: 256000-020397
Rate: TOU-PA2D

SCE will send daily updates until conditions improve. For more information, please visit sce.com/psps. Downed power line? Stay away, call 911, and SCE at 1-800-611-1911.

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Tuesday, September 17, 2019 6:30 PM
To: Hancocks, Brandyn
Subject: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

SCE continues to explore options for a potential Public Safety Power Shutoff (PSPS) in your area. No power has been shut off at this time. We are identifying circuits in that area that might be affected by dangerous high winds in high fire risk areas, and continue outreach to local officials and customers in advance of a potential decision to shut off power. Please be prepared with your personal emergency plan.

The following address(es) are within areas being monitored:

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60

Meter: 256000-020397
Rate: TOU-PA2D

SCE will send daily updates until conditions improve. For more information, please visit sce.com/psps. Downed power line? Stay away, call 911, and SCE at 1-800-611-1911.

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: Updated PSPS Circuit List for 9-16-19
Attachments: Golden State Water 9-16-19 SA by Circuits_PSPS.xlsx

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: James Pasmore <James.Pasmore@sce.com>
Sent: Monday, September 16, 2019 4:39 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: Updated PSPS Circuit List for 9-16-19

EXTERNAL EMAIL
Karla, Brandyn:

Please see attached spreadsheet for potentially impacted accounts for PSPS. Let me know if you have any questions.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

SOUTHERN CALIFORNIA EDISON | Energy for What's Ahead™
www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

Top Customer Name	Top Customer Number	Customer Name	CSS Customer Number	Installed_Service_NUM	Serv Acct Number	SA Name	Meter (1-5)	Cust Acct Number	Rate	Serv Acct Address	Serv Acct City	Zip	Circuit	HFA	Substation
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	3860354	6965	V 387 8031-SUTTER 1	256000-087471	4448718	TOU-GS1E	2405 Plant M-8	Lucerne Valley	92356	SKY HI	Y	Lucerne
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	5060910	7023	V 387.8031-TOPAZ 1	256000-058098	4448718	TOU-PA2E	2446 Plant L-9	Lucerne Valley	92356	SKY HI	Y	Lucerne
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	5206396	6960	V 387 8031-MEB 1I/A BSTR	256000-020397	4448718	TOU-PA2D	8726 Mesa Rd	Lucerne Valley	92356	SKY HI	Y	Lucerne
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	7483517	3252425	2 387-8031	256000-138980	4448718	TOU-PA2E	32172 Silver Creek	Lucerne Valley	92356	SKY HI	Y	Lucerne

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:07 AM
To: Pegg, Pamela J.
Subject: FW: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Tuesday, September 17, 2019 7:51 AM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Subject: FW: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

Hi Karla,
Can you track all the potential PSPS that occur? I expect that at some point someone, such as PUC, will ask how often and where these potential and actual PSPS events occur.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Tejada, Karla
Sent: Monday, September 16, 2019 9:07 PM
To: SCEoutage <SCEoutage@gswater.com>
Cc: Dahlstrom, Perry <Pldahlstrom@gswater.com>; Bell, Tyson <Tyson.Bell@gswater.com>
Subject: Fwd: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification

Begin forwarded message:

> **From:** Southern California Edison <do_not_reply@scewebservices.com>
> **Date:** September 16, 2019 at 7:46:18 PM PDT
> **To:** karla.tejada@gswater.com
> **Subject: SCE Safety Alert: Public Safety Power Shutoff (PSPS) 1-Day Notification**
>
> EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

SCE continues to explore options for a potential Public Safety Power Shutoff (PSPS) in your area. No power has been shut off at this time. We are identifying circuits in that area that might be affected by dangerous high winds in high fire risk areas, and continue outreach to local officials and customers in advance of a potential decision to shut off power. Please be prepared with your personal emergency plan.

The following address(es) are within areas being monitored:

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LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

SCE will send daily updates until conditions improve. For more information, please visit sce.com/psps. Downed power line? Stay away, call 911, and SCE at 1-800-611-1911.

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Sunday, September 15, 2019 3:57 PM
To: Hancocks, Brandyn
Subject: This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

SCE continues to explore options for a potential Public Safety Power Shutoff (PSPS) in your area. No power has been shut off at this time. We are identifying circuits in that area that might be affected by dangerous high winds in high fire risk areas, and continue outreach to local officials and customers in advance of a potential decision to shut off power. Please be prepared with your personal emergency plan.

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Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Saturday, September 14, 2019 12:35 PM
To: Hancocks, Brandyn
Subject: This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

SCE continues to explore options for a potential Public Safety Power Shutoff (PSPS) in your area. No power has been shut off at this time. We are identifying circuits in that area that might be affected by dangerous high winds in high fire risk areas, and continue outreach to local officials and customers in advance of a potential decision to shut off power. Please be prepared with your personal emergency plan.

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8726 MESA RD
LUCERNE VALLEY, CA 92356

Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Friday, September 13, 2019 11:34 AM
To: Hancocks, Brandyn
Subject: This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in your area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

The following address(es) are within areas being monitored:

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
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LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356

Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank You,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Sunday, September 8, 2019 6:11 PM
To: Hancocks, Brandyn
Subject: This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to current conditions, your area has been removed from Public Safety Power Shutoff consideration, and no electric service will be proactively turned off at this time. If outages due to other reasons unrelated to Public Safety Power Shutoffs occur in your area, SCE will work as quickly as possible to restore your service. For more information please visit our website at www.sce.com. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

The following address(es) are no longer in areas being monitored:

2405 PLANT M-6
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-63
Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356

Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Saturday, September 7, 2019 12:32 PM
To: Hancocks, Brandyn
Subject: This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in your area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

The following address(es) are within areas being monitored:

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Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank You,

Southern California Edison

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: (External):This is an important public safety (PSPS) message from Southern California Edison

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: James Pasmore <James.Pasmore@sce.com>
Sent: Saturday, September 14, 2019 3:12 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: FW: (External):This is an important public safety (PSPS) message from Southern California Edison

EXTERNAL EMAIL
Karla, Brandyn:

As you can see starting about a week ago, our automated PSPS messaging has seen some improvements that now include the potentially impacted service addresses.

Please contact me with any questions or concerns.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Southern California Edison [mailto:do_not_reply@scewebservices.com]
Sent: Friday, September 13, 2019 11:34 AM
To: James Pasmore <James.Pasmore@sce.com>
Subject: (External):This is an important public safety (PSPS) message from Southern California Edison

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in your area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

The following address(es) are within areas being monitored:

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Rate: TOU-PA2E

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Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank You,

Southern California Edison

Privacy Notice

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: (External):Re: This is an important public safety (PSPS) message from Southern California Edison

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: James Pasmore <James.Pasmore@sce.com>
Sent: Sunday, September 8, 2019 2:34 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):Re: This is an important public safety (PSPS) message from Southern California Edison

Karlla,

Yes. There are still a number of circuits being monitored due to prolonged high temperatures. We will have an official update later this afternoon/early evening. The same account list that was provided yesterday remains unchanged.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

SOUTHERN CALIFORNIA EDISON | Energy for What's Ahead™
www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Tejada, Karla [mailto:Karla.Tejada@gswater.com]
Sent: Sunday, September 08, 2019 2:12 PM
To: James Pasmore <James.Pasmore@sce.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: (External):Re: This is an important public safety (PSPS) message from Southern California Edison

James,

Can you provide an update. Is this still active?
Karla

On Sep 7, 2019, at 4:24 PM, James Pasmore <James.Pasmore@sce.com> wrote:

EXTERNAL EMAIL
Karla, Brandyn:

Good afternoon. I wanted to be sure you saw the PSPS message earlier this afternoon. As you can see, we have implemented some improvements to our outreach messaging and now are able to display the service address, rate, and meter number of any affected accounts.

Let me know if you have any questions or concerns.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

<image005.png>
www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Southern California Edison [mailto:do_not_reply@scewebservices.com]
Sent: Saturday, September 07, 2019 12:32 PM
To: James Pasmore <James.Pasmore@sce.com>
Subject: (External):This is an important public safety (PSPS) message from Southern California Edison

<image006.jpg>

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in your area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

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Meter: 256000-056098
Rate: TOU-PA2E

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Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank You,

Southern California Edison

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Facebook is a trademark of Facebook, Inc. Twitter is a trademark of Twitter, Inc. Instagram is a trademark of Instagram, LLC.


Privacy Notice

Privacy Notice

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: This is an important public safety (PSPS) message from Southern California Edison

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Saturday, September 7, 2019 8:18 PM
To: James Pasmore <James.Pasmore@sce.com>
Subject: Re: This is an important public safety (PSPS) message from Southern California Edison

Thank you

On Sep 7, 2019, at 4:24 PM, James Pasmore <James.Pasmore@sce.com> wrote:

> EXTERNAL EMAIL
> Karla, Brandyn:
>
> Good afternoon. I wanted to be sure you saw the PSPS message earlier this afternoon. As you can see, we have implemented some improvements to our outreach messaging and now are able to display the service address, rate, and meter number of any affected accounts.
>
> Let me know if you have any questions or concerns.
>
> Thank you.
>
> **James I Pasmore Jr, C.E.M**
> Key Accounts, Senior Advisor
> Business Customer Division, Water Sector
> T. 714-973-5759 | M. 714-227-3283
>
> 1325 S Grand Ave, Santa Ana, CA, 92705
>
> <image005.png>
> www.sce.com/outages
> 24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com
>
>

From: Southern California Edison [mailto:do_not_reply@scewebservices.com]
Sent: Saturday, September 07, 2019 12:32 PM

To: James Pasmore <James.Pasmore@sce.com>
Subject: (External):This is an important public safety (PSPS) message from Southern California Edison

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in your area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

The following address(es) are within areas being monitored:

2405 PLANT M-6
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Meter: 256000-087471
Rate: TOU-GS1E

2446 PLANT L-9
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX70-23
Meter: 256000-056098
Rate: TOU-PA2E

32172 SILVER CREEK
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX42-52
Meter: 256000-138980
Rate: TOU-PA2E

8726 MESA RD
LUCERNE VALLEY, CA 92356
Service Account: 3-XXX-XX69-60
Meter: 256000-020397
Rate: TOU-PA2D

Thank You,

Southern California Edison

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Privacy Notice

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: (External):RE: PSPS Circuit List for Morongo Valley - MORONGI

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: James Pasmore <James.Pasmore@sce.com>
Sent: Wednesday, July 17, 2019 10:11 AM
To: Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):RE: PSPS Circuit List for Morongo Valley - MORONGI

Karla,

Apologies again for the delay. As of 1600 hours yesterday evening, MORONGO no longer meets weather threshold conditions for potential PSPS activation.

Thank you.

James i Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

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www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Tejada, Karla [mailto:Karla.Tejada@gswater.com]
Sent: Wednesday, July 17, 2019 8:56 AM
To: James Pasmore <James.Pasmore@sce.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: (External):RE: PSPS Circuit List for Morongo Valley - MORONGI

Thanks James. Do we have an update?

From: James Pasmore [mailto:James.Pasmore@sce.com]
Sent: Tuesday, July 16, 2019 11:56 AM

To: Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: PSPS Circuit List for Morongo Valley - MORONGI

EXTERNAL EMAIL
Karla, Brandyn:

Please see attached list for potentially impacted accounts on the MORONGO circuit. These will be associated with the messaging you received last evening.

Let me know if you have any questions.

I expect another update on PSPS weather conditions within the next **two hours**.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

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Top Customer Name	Top Customer Number	Customer Name	CSS Customer Number	Serv Acct Number	SA Name	Meter (1-5)	Cust Acct Number	Rate	Serv Acct Address	Serv Acct City	Zip	Contact Level	Main Contact Name	Contact Phone	Contact Mobile	Contact Email
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	6787	DEL SUR 359.8031-YEAGER-VALE 2	298000-107929	24191967	TOU-PA2E	11077 Vale Dr	Morongo Valley	92256	CU	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	1157053	DEL SUR 359.8031-VISTA BOOSTER	2220I4-030870	24191967	TOU-PA2E	49109 Vista Dr	Morongo Valley	92256	CU	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	7010	DEL NORTE 359.8031-ELM 24	298000-217582	24191967	TOU-GS1E	51340 Elm St	Morongo Valley	92256	CU	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	7022	DELSUR 359.8031-YEAGER-VALE 3	298000-217559	24191967	TOU-PA2E	108 Plant D9	Morongo Valley	92256	CU	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com
AMERICAN STATES WATER COMPANY	5514190	GOLDEN STATE WATER COMPANY	2502	31087479	DEL SURE VALE 359.8031	A2A002-002416	24191967	TOU-PA2E	11121 Vale Dr	Morongo Valley	92256	CU	Karla Tejada	7145357711	9168042481	Karla.Tejada@gswater.Com
		No. of Service Accounts		**12**					**Sum of Max kW: 265**							

Annual Max Kw (Highest Demand)	Annual kWh	Circuit	HFA	Substation	ABANK
28	730	MORONGO	Y	MORONGO P1	DEVERS
2	9,068	MORONGO	Y	MORONGO P1	DEVERS
12	87	MORONGO	Y	MORONGO P1	DEVERS
24	3,808	MORONGO	Y	MORONGO P1	DEVERS
22	96,761	MORONGO	Y	MORONGO P1	DEVERS
Max of Max kW: 74	288,548				

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@scewebservices.com>
Sent: Monday, July 15, 2019 6:43 PM
To: Hancocks, Brandyn
Subject: This is an important safety message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

SCE continues to explore options for a potential Public Safety Power Shutoff (PSPS) in the MORONGO VALLEY area. No power has been shut off at this time. We are identifying circuits in that area that might be affected by dangerous high winds in high fire risk areas, and continue outreach to local officials and customers in advance of a potential decision to shut off power. Please be prepared with your personal emergency plan.

Thank you,

Southern California Edison

Pegg, Pamela J.

From: Southern California Edison <do_not_reply@webservices.com>
Sent: Monday, July 1, 2019 12:13 PM
To: Hancocks, Brandyn
Subject: This is an Important Message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in the MORONGO VALLEY area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

Thank You,

Southern California Edison

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: Southern California Edison - Potential PSPS event

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Kruger, Denise L.
Sent: Thursday, June 20, 2019 10:05 AM
To: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: Southern California Edison - Potential PSPS event

Thanks Brandy.

Kind regards,
Denise

From: Hancocks, Brandyn
Sent: Wednesday, June 19, 2019 2:13 PM
To: SCEoutage <SCEoutage@gswater.com>
Cc: Burk, Ray <Ray.Burk@gswater.com>; Timberlake, Judy <Judy.Timberlake@gswater.com>
Subject: RE: Southern California Edison - Potential PSPS event

Right now they are anticipating the PSPS event from 3:00 PM on Thursday until 9:00 PM Friday. I will have another call with SCE tomorrow at 2:00. I will keep you posted on any new information I receive.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Wednesday, June 19, 2019 10:05 AM
To: SCEoutage <SCEoutage@gswater.com>
Subject: Southern California Edison - Potential PSPS event

SCE has sent notice of a potential Public Safety Power Shutoff. Affected areas in Apple Valley and Lucerne listed below.

Top Customer Name	Customer Name	Serv Acct Number	SA Name	Meter (1-5)	Rate	Serv Acct Address
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6959	V.V.1 364.8031-MOHAWK 3A	A2A002-002231	TOU-PA2D	2212 Plant I-8
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6867	V.V.1 364.8031-MOHAWK BST ABC	A2A002-002414	TOU-PA2D	2243 Plant I-9
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6963	V. 367.8031-SUTTER 1	256000-087471	TOU-GS1E	2405 Plant M-6
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	7023	V. 367.8031-TOPAZ 1	256000-056098	TOU-PA2E	2446 Plant L-9
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	1157043	V.V1 364.8031-MOHAWK 2	A2A002-002165	TOU-PA2E	10711 Nandina Rd
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6960	V. 367.8031-MEB 11/A BSTR	256000-020397	TOU-PA2D	8726 Mesa Rd
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	32524252	367-8031	256000-138980	TOU-PA2E	32172 Silver Creek

Affected areas should have already received direct notification from SCE and this email notification should be a duplicate. This email is intended to serve as a wider distribution for situational awareness purposes across all of our Districts. This is the first notification we've received from SCE regarding a PSPS event. SCE's notification process is still being refined and hopefully improvements will be made in future. If there are any concerns regarding the notification process, please contact Karla Tejada.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171

email: bhancocks@gswater.com

From: Southern California Edison <do_not_reply@webservices.com>
Sent: Wednesday, June 19, 2019 9:25 AM
To: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: This is an important safety message from Southern California Edison

EXTERNAL EMAIL

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in the area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

Thank You

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Please do not reply to this email; this is not a monitored email address.

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: SCE PSPS Warning - Account List

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Friday, June 28, 2019 4:33 PM
To: Dahlstrom, Perry <Pldahlstrom@gswater.com>
Subject: Fwd: SCE PSPS Warning - Account List

Don't know if you got the heads up as well

Begin forwarded message:

> **From:** James Pasmore <James.Pasmore@sce.com>
> **Date:** June 28, 2019 at 4:27:48 PM PDT
> **To:** "Tejada, Karla" <Karla.Tejada@gswater.com>, "Hancocks, Brandyn" <Brandyn.Hancocks@gswater.com>
> **Subject: SCE PSPS Warning - Account List**
>
> EXTERNAL EMAIL
> Karla, Brandyn:
>
> A weather system moving into the SCE service territory starting Sunday (6/30) is expected to bring locally gusty winds and dry conditions creating an elevated fire weather threat across the desert areas, Southern California mountains, San Joaquin Valley, and the Southern Sierra foothills. Peak wind gusts will be mainly in the 35 to 55 mph range, with isolated gusts up to 70 mph possible.
>
> Only one account has been identified:

	A	B	C	D	
1	Customer Name	Customer BPID	Serv Acct Number	SA Name	Met
2	GOLDEN STATE WATER COMPANY	0063482307	1157054	DEL SUR 359.8031-MOJVE A&B BST	256000-2

Please contact me with any questions.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

Privacy Notice

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: PSPS Update - Outage timing update. Outage to begin today at noon

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Friday, June 21, 2019 8:06 AM
To: Porterfield, Jamie <JamiePorterfield@gswater.com>
Subject: RE: PSPS Update - Outage timing update. Outage to begin today at noon

Sorry I wasn't able to get better information. This is literally SCE's first rodeo and there are quite a few things that need to be improved. We'll keep applying pressure to try for improvements to the notifications.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Porterfield, Jamie
Sent: Thursday, June 20, 2019 3:11 PM
To: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: PSPS Update - Outage timing update. Outage to begin today at noon

Brandyn,

Has there been an update with some accurate times for outages in Apple Valley and Lucerne Valley? I've seen a few different outage times so I'm not really sure which time to go by. For example I am seeing 3 pm and 9 pm today for our Mohawk 3A well. Additionally, I'm seeing 12 noon for Emerald plant site but we still have power.

Any additional info you might have would be greatly appreciated.

Thank you

Jamie Porterfield
Golden State Water Company
Operations Superintendent Apple Valley/Morongo

Office: (760) 247-3391 Ext 112
Mobile: (442) 267-7868

From: Hancocks, Brandyn
Sent: Thursday, June 20, 2019 12:22 PM
To: Cullado, Regina <Regina.Cullado@gswater.com>
Cc: Dahlstrom, Perry <Pldahlstrom@gswater.com>; Porterfield, Jamie <JamiePorterfield@gswater.com>; Tejada, Karla <Karla.Tejada@gswater.com>; Gedney, William C. <WCGEDNEY@gswater.com>; White, Dawn R. <Dawn.White@gswater.com>
Subject: FW: PSPS Update - Outage timing update. Outage to begin today at noon

Regina,
FYI
Southern California Edison is activating Public Safety Power Shutdown this afternoon in parts of our Mtn. Desert district. This is a precautionary wildfire de-energization due to weather conditions As I understand, we have generators in place and do not expect an impact to water customers. I'll keep you in the loop as I know more information.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Thursday, June 20, 2019 10:47 AM
To: SCEoutage <SCEoutage@gswater.com>
Subject: PSPS Update - Outage timing update. Outage to begin today at noon

Updated notification received by the California State Warning Center from SCE at 0741 hours, 6/20/19, indicates a change in the timing window of the potential de-energization. Updated timing is now forecast by SCE to bgin at 1200 hours, 6/20/2019.

Attached is a Public Safety Power Shutoff (PSPS) notification from the California Governor's Office of Emergency Services State Warning Center.

SCE is at PSPS Stage, **Activating OEC / Potential for PSPS**, due to a threatening weather event in portions of **Los Angeles and San Bernardino County** from **06/20/19 at 1200 hours to 06/21/19 at 1800 hours** See the attached PSPS form for further details.

* Total Potential Customer Impact: 6,464 customers (no change)

* Medical Baseline Customer Impact Potential: 196 customers

* Critical Care Customer Impact Potential: 76 customers

Perry received a notice this morning at 6:51am that the shut down would be on the morning of 6/21. This more recent notification now says 6/20 at noon.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: PSPS Update - Outage timing update. Outage to begin today at noon
Attachments: CalOES PSPS Notification Form-6-20-19 AM Update.pdf

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Thursday, June 20, 2019 12:11 PM
To: Cullado, Regina <Regina.CULLADO@gswater.com>
Cc: Dahlstrom, Perry <Pldahlstrom@gswater.com>; Porterfield, Jamie <JamiePorterfield@gswater.com>; Tejada, Karla <Karla.Tejada@gswater.com>; Gedney, William C. <WCGEDNEY@gswater.com>; White, Dawn R. <Dawn.White@gswater.com>
Subject: FW: PSPS Update - Outage timing update. Outage to begin today at noon

Regina,
FYI
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Brandyn Hancocks
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Environment, Safety, Emergency Preparedness, Training & Development
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3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Thursday, June 20, 2019 10:47 AM
To: SCEoutage <SCEoutage@gswater.com>
Subject: PSPS Update - Outage timing update. Outage to begin today at noon

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Brandyn Hancocks
Compliance Manager
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Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

Report Date:	6/20/2019	Report Time:	7:30AM

Please complete this form per instructions on the following page and
send to the California State Warning Center at warning.center@oes.ca.gov.
Please call the Warning Center with and questions or concerns at (916) 845-8911.

Notification Type					
Activating OEC/Potential for PSPS		Decision to De-Energize		De-Energization Initiated	
Initiated Assessment to Re-Energize		All PSPS Lines Re-Energized			
Is this an update notification?	YES ✓	NO			
If Yes, provide update number:					

Reporting Utility: Southern California Edison
Utility Operational Period: 0600 - 1800
Proposed Briefing Times: 1. Briefing with CalOES at 1300 by Conference Call-State Executive Briefing 2. 3.

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

Report Date:	6/20/2019	Report Time:	7:30AM

Potential Impact

County	Location(s)	# of Customers	Estimated Time of De-energization	Actual Time of De-energization	Estimated Time of Restoration
San Bernardino	Sky Hi	1584	6/20; 1200 - 6/21;1800		
San Bernardino	Camprock Circuit	8	6/20; 1500 - 6/21; 0300		
San Bernardino	Tussing	1860	6/20; 2100 - 6/21; 1500		
Los Angeles	Sun Village Circuit	1503	6/20; 12:00 - 6/20; 2100		
Los Angeles	Titan Circuit	1509	6/20; 12:00 - 6/21; 1500		
TOTAL:					
Number of medical baseline customers:		272			
Projected end date of weather event:		6/21/19			

Critical Infrastructure (including, but not limited to, hospitals, fire stations, police stations, water treatment facilities, schools, etc.)

County	Location(s)/Description of Infrastructure	Estimated Time of Restoration
	See Rest Service	

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

Report Date:	6/20/2019	Report Time:	7:30AM

Current Impact

County	Location(s)	# of Customers	Estimated Time of De-energization	Actual Time of De-energization	Estimated Time of Restoration
	See Rest Service				
TOTAL:					
Number of medical baseline customers:					
Projected end date of weather event:					

Critical Infrastructure (including, but not limited to, hospitals, fire stations, police stations, water treatment facilities, schools, etc.)

County	Location(s)/Description of Infrastructure	Estimated Time of Restoration
	See Rest Service	

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

Report Date:	6/20/2019	Report Time:	7:30AM

Public Notification Information

Proposed Public Notification Language (List by Customer Type)

Type: Local Government Officials

This message is from the Southern California Edison Liaison Officer for official use by local government officials.

Due to projected weather conditions, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) serving portions of some cities and unincorporated areas in Los Angeles County as early as Thursday, June 20.

Please note that while these areas may experience storm-related outages, SCE has not proactively shut off power at this time.

The following circuits in your County are currently on SCE's PSPS watch list:

Sun Village Circuit
- Palmdale
- Unincorporated communities including Littlerock, Llano, Pearblossom, and Valyermo

Titan Circuit
- Palmdale
- Unincorporated communities including Juniper Hills, Littlerock, Llano, Pearblossom, and Valyermo

Sky Hi Circuit
- Apple Valley
- Hesperia
- Victorville
- Unincorporated communities including Lucerne Valley

Tussing Circuit
- Apple Valley
- Victorville

Hesperia
- Unincorporated communities

Camprock Circuit
- Unincorporated communities including Lucerne Valley

SCE has activated a PSPS Incident Management Team (IMT) to monitor conditions. The actual onset of weather conditions and other circumstances beyond our control may impact coordination and notification efforts. As such, there is a possibility that a PSPS event could be called sooner than anticipated, additional circuits could be impacted, or conditions could change, resulting in shutoffs no longer being considered for one or more circuits. We will attempt to notify you as conditions change.

SCE will also begin notifying customers on the impacted circuits to inform them about the potential shutoff to give them time to prepare.

For your reference, PDF and GIS circuit maps may be found at www.sce.com/maps

Please call 855-683-9067 if you have any questions. This number is for government agencies only. The Incident Management Team (IMT) Liaison Officer can be reached by email at SCELiaisonOfficer@sce.com. The public should call 800-611-1911 if they have questions.

Again, no Public Safety Power Shutoffs have been initiated by SCE at this time.

Method of Public Notification (Check All That Apply)

Automated Notification System: SMS/Text Message		Automated Notification System: Voice Message/Phone	
Automated Notification System: Email		Operator Conducted Phone Call	
Media Outreach		Social Media	
Field Visit		Local/Tribal Government Coordination	

Other – Please Specify:

Notification using Everbridge.

Entities to be Notified

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: PSPS Notification

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Wednesday, June 19, 2019 4:34 PM
To: Gedney, William C. <WCGEDNEY@gswater.com>; Tejada, Karla <Karla.Tejada@gswater.com>
Subject: FW: PSPS Notification

Just FYI. DDW is getting notifications direct from CalOES and following up with water utilities.

From: Zakhari, George
Sent: Wednesday, June 19, 2019 4:23 PM
To: Porterfield, Jamie <JamiePorterfield@gswater.com>
Cc: White, Dawn R. <Dawn.White@gswater.com>; Dahlstrom, Perry <Pldahlstrom@gswater.com>
Subject: FW: PSPS Notification

Jamie,

I just wanted to confirm with you before I respond back to DDW. Please see my answer below in red and let me know if I'm missing anything.

Thanks,
George

From: Ramirez, Mario@Waterboards <Mario.Ramirez@Waterboards.ca.gov>
Sent: Wednesday, June 19, 2019 3:48 PM
To: Zakhari, George <George.Zakhari@gswater.com>
Subject: PSPS Notification

EXTERNAL EMAIL
George,

I have received notification from the California Governor's Office of Emergency Services (Cal OES) State Warning Center that Southern California Edison (SCE) is activating Public Safety Power Shutoff (PSPS) protocol due to threatening

weather events in parts of Apple & Lucerne Valley **on the morning of 6/21/2019**. It looks like facilities in **GSWC – APPLE VLY SOUTH** and **GSWC – LUCERNE** may experience this shutoff. I wanted to reach out to give your system a heads up and ask:

- Was your water system notified regarding this potential power shut down? Yes, we were notified by Edison this morning.
- Is your water system prepared to maintain water service during this planned outage? Yes
- What, if any, precautions does your water system have in preparation for these power shutoffs? We have backup generator to maintain well pumps and booster stations in service during the power outage.

Now that PSPS is becoming common practice, it is more important than ever to ensure your system has adequate storage capacity, emergency interconnections and auxiliary power. Please let me know if you have any questions.

Mario E. Ramirez
Water Resources Control Engineer
State Water Resources Control Board
Division of Drinking Water – San Bernardino District
464 West 4th Street, Ste 437
San Bernardino, CA 92401

Phone: (909) 383-0003
Email: mario.ramirez@waterboards.ca.gov
http://www.waterboards.ca.gov/drinking_water/programs/

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: (External):RE: (External):FW: This is an important safety message from Southern California Edison

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Wednesday, June 19, 2019 2:13 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Subject: RE: (External):RE: (External):FW: This is an important safety message from Southern California Edison

Got timeline from jenny in the SOC.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Tejada, Karla
Sent: Wednesday, June 19, 2019 2:09 PM
To: James Pasmore <James.Pasmore@sce.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):RE: (External):FW: This is an important safety message from Southern California Edison

James,
To follow on, can you also provide a general window (over next 24 hrs or 48 hrs) as to when or how long we'll be on alert for a shutdown? I know it's all weather driven, but that would be helpful, so we can inform our staff.

Karla

I left you a voice

From: James Pasmore [mailto:James.Pasmore@sce.com]
Sent: Wednesday, June 19, 2019 10:07 AM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):RE: (External):FW: This is an important safety message from Southern California Edison

Karla,

Let me pull that together for you and I'll get to both of you ASAP.

Thanks.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Tejada, Karla [mailto:Karla.Tejada@gswater.com]
Sent: Wednesday, June 19, 2019 10:05 AM
To: James Pasmore <James.Pasmore@sce.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):RE: (External):FW: This is an important safety message from Southern California Edison

Thank you James.

1) Can you send me an updated list of who is receiving the original PSPS email notifications? Since I was out for 6 months I'd like to cross walk.
2) Of folks on your list to notify, for all GSW, in addition to emails what other notification platforms (text, phone calls?) are being used for notifications?
3)

Karla

From: James Pasmore [mailto:James.Pasmore@sce.com]
Sent: Wednesday, June 19, 2019 9:47 AM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):RE: (External):FW: This is an important safety message from Southern California Edison

Karla, Brandyn:

Good morning. I refined the search and came up with some potentially impacted locations on two circuits. Please note that these circuits are NOT designated in a High Fire Area, but due to forecasted high winds, they are in scope.

Please let me know if you have any additional questions or concerns. I am in a workshop most of the day, but can step out if you need to reach me.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor

Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Tejada, Karla [mailto:Karla.Tejada@gswater.com]
Sent: Wednesday, June 19, 2019 9:38 AM
To: James Pasmore <James.Pasmore@sce.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: (External):RE: (External):FW: This is an important safety message from Southern California Edison

If you'll note that the message was sent at 9:25AM. That would be great. Thank you.

From: James Pasmore [mailto:James.Pasmore@sce.com]
Sent: Wednesday, June 19, 2019 9:36 AM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: RE: (External):FW: This is an important safety message from Southern California Edison

Karla,

Thanks for reaching out. There was a list of four potential circuits identified last evening, but I had no impacted accounts listed for any of my customers.

I will check to see if the list has been updated again this morning and determine if any Golden State Water sites are affected.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector
T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

www.sce.com/outages
24 hour Emergency Communications Team at (855) 683-9067 or scepoc@sce.com

From: Tejada, Karla [mailto:Karla.Tejada@gswater.com]
Sent: Wednesday, June 19, 2019 9:32 AM
To: James Pasmore <James.Pasmore@sce.com>
Cc: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>

Subject: (External):FW: This is an important safety message from Southern California Edison
Importance: High

Hi James,
Can you provide me a list of addresses and related circuits that may be affected. I've left you a voicemail as well.

Thanks,
Karla

From: Southern California Edison [mailto:do_not_reply@webservices.com]
Sent: Wednesday, June 19, 2019 9:25 AM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Subject: This is an important safety message from Southern California Edison

EXTERNAL EMAIL

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in the area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

Thank You

Privacy Notice | Terms and Conditions | Contact Us | Unsubscribe

Please do not reply to this email; this is not a monitored email address.

Facebook is a trademark of Facebook, Inc. Twitter is a trademark of Twitter, Inc. Instagram is a trademark of Instagram, LLC.

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: Southern California Edison - Potential PSPS event

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Wednesday, June 19, 2019 1:22 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Subject: FW: Southern California Edison - Potential PSPS event

Do you mind giving James another call? What is the timeframe for potential shut down? Should we be ready for the next 24 hours or 36? Do they declare an all clear at some point and provide follow up notification? There should be some timeframe in the notification "Due to projected weather conditions in the next X hours/days in your area…

We can't stage people an equipment indefinitely.

From: Hancocks, Brandyn
Sent: Wednesday, June 19, 2019 10:05 AM
To: SCEoutage <SCEoutage@gswater.com>
Subject: Southern California Edison - Potential PSPS event

SCE has sent notice of a potential Public Safety Power Shutoff. Affected areas in Apple Valley and Lucerne listed below.

Top Customer Name	Customer Name	Serv Acct Number	SA Name	
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6959	V.V.1 364.8031-MOHAWK 3A	A 0
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6867	V.V.1 364.8031-MOHAWK BST ABC	A 0
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6963	V. 367.8031-SUTTER 1	2 0
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	7023	V. 367.8031-TOPAZ 1	2 0
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	1157043	V.V1 364.8031-MOHAWK 2	A 0
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	6960	V. 367.8031-MEB 11/A BSTR	2 0
AMERICAN STATES WATER COMPANY	GOLDEN STATE WATER COMPANY	32524252	367-8031	2 1

Affected areas should have already received direct notification from SCE and this email notification should be a duplicate. This email is intended to serve as a wider distribution for situational awareness purposes across all of our Districts. This is the first notification we've received from SCE regarding a PSPS event. SCE's notification process is still being refined and hopefully improvements will be made in future. If there are any concerns regarding the notification process, please contact Karla Tejada.

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Southern California Edison <do_not_reply@webservices.com>
Sent: Wednesday, June 19, 2019 9:25 AM
To: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: This is an important safety message from Southern California Edison

EXTERNAL EMAIL

SOUTHERN CALIFORNIA EDISON

Manage your account online.

Due to projected weather conditions in your area that may cause power outages, SCE is exploring options for a potential Public Safety Power Shutoff (PSPS) of electrical circuits in High Fire Risk Areas (HFRA) and, as a precaution, may also proactively turn off power for public safety in the area. SCE has not proactively turned off any power at this time. Please be prepared with your personal emergency plan. For more information please visit our website at WWW.SCE.COM. If you see a downed power line, stay away, call 911, and report this to SCE at 1-800-611-1911.

Thank You

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:13 AM
To: Pegg, Pamela J.
Subject: FW: PSPS activation
Attachments: PG&E PSPS 20190608 0920.pdf; ATT00001.htm; Event1OverviewV4 Map Reduced File Size 06_08_19.pdf; ATT00002.htm; Event2OverviewV3 Map Reduced File Size 6_8_19.pdf; ATT00003.htm

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Hancocks, Brandyn
Sent: Saturday, June 8, 2019 11:02 AM
To: PGEoutage <PGEoutage@gswater.com>
Subject: Fwd: PSPS activation

Fyi, This is a courtesy notice from CalOES and CUEA. As a board member I get all notices statewide. Unlike previous notifications for maintenance or outages, this is the first actual PSPS activation since the new program has been adopted. I have not received any individual notifications for circuits impacting our systems or facilities. I will keep you updated as the weather conditions change or potential impacts to our device areas.

Begin forwarded message:

> **From:** "Regino, Jenny@CalOES" <Jenny.Regino@CalOES.ca.gov>
> **To:** "Boland, Don@CalOES" <Don.Boland@CalOES.ca.gov>
> **Cc:** "Attilio Zasso (tio.zasso@water.ca.gov)" <tio.zasso@water.ca.gov>, "Barbara Winn (bw1513@att.com)" <bw1513@att.com>, "Brent Yamasaki (byamasaki@MWDh2o.com)" <byamasaki@mwdh2o.com>, "Chirstopher Broyhill (christopher.broyhill@smud.org)" <christopher.broyhill@smud.org>, "Chris Salkeld (cs9296@att.com)" <cs9296@att.com>, "Chris Snyder" <CRSY@pge.com>, "Christopher Vicino (Christopher.Vicino@ladwp.com)" <Christopher.Vicino@ladwp.com>, "Donald Daigler (Donald.Daigler@sce.com)" <Donald.Daigler@sce.com>, "Ghio, August F" <AGhio@semprautilities.com>, "Hancocks, Brandyn" <Brandyn.Hancocks@gswater.com>, "Ian Whyte (jwhyte@mwdh2o.com)" <jwhyte@mwdh2o.com>, "James Cigler - Verizon Wireless (james.cigler@verizonwireless.com)" <james.cigler@verizonwireless.com>, "Jeff Briggs" <jeff.briggs@smud.org>, "Lisa Hayes (lisa.hayes@ladwp.com)" <lisa.hayes@ladwp.com>, "Manuel Garcia" <mgarcia@ci.vernon.ca.us>, "Miles.Bower@cox.com" <Miles.Bower@cox.com>, "Paul Krahl" <paul.krahl@swgas.com>, "sam.grandlienard@swgas.com" <sam.grandlienard@swgas.com>, "Thomas Badger" <thomas.badger@verizonwireless.com>, "Todd Dusenberry" <tdusenberry@ci.vernon.ca.us>, "Tom Jacobus (thomas.jacobus@sce.com)" <thomas.jacobus@sce.com>, "Michael Sabbaghian"

<michaelsabbaghian@caloes3650.onmicrosoft.com>
Subject: PSPS

EXTERNAL EMAIL
Good morning CUEA board members,

FYI

This is a Public Safety Power Shutoff (PSPS) Notification. This is a message from the California Governor's Office of Emergency Services. PG&E, has notified the California State Warning Center that they are at the following PSPS Stages, Decision to De-Energize and De-Energization Initiated, due to a threatening weather event in portions of Napa, Solano, Yolo, Butte, El Dorado, Nevada, Placer, Yuba Counties . Please see attached PSPS form and maps for further details.

State agency partners can access PSPS GIS data provided by PGE to Cal OES through the Arc GIS Online Cal OES Emergency Management Collaboration State Partners Group.

Local partners can access PSPS GIS data provided by PGE to Cal OES through the Arc GIS Online Cal OES Emergency Management Collaboration Local Government Group.

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

Report Date:	6/8/2019	Report Time:	0800

Please complete this form per instructions on the following page and send to the California State Warning Center at warning.center@oes.ca.gov.
Please call the Warning Center with and questions or concerns at (916) 845-8911.

Notification Type					
Activating OEC/Potential for PSPS		Decision to De-Energize	✔	De-Energization Initiated	✔
Initiated Assessment to Re-Energize		All PSPS Lines Re-Energized			
Is this an update notification?	YES ✔	NO			
If Yes, provide update number:	3				

Reporting Utility: Pacific Gas & Electric
Utility Operational Period: 3
Proposed Briefing Times: 1. 06/08/2019 1130 & 1900 - State Agency 2. 06/08/2019 1230 & 2000 - Regional 3.

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

Report Date:	6/8/2019	Report Time:	0800

Potential Impact

County	Location(s)	# of Customers	Estimated Time of De-energization	Actual Time of De-energization	Estimated Time of Restoration
Napa	Napa(Un/Incorporated, Suisun City, Lake Berryessa, Napa)	1331		6/8 06:18	
Solano	Suisun City, Vacaville, Winters	192		6/8 06:18	
Yolo	Yolo (Unincorporated)	85		6/8 06:18	
Butte		14405	6/8, 2100		
El Dorado		3604	6/8, 2100		
Nevada		5458	6/8, 2100		
Placer		164	6/8, 2100		
Yuba		3249	6/8, 2100		
	Total:	28,488			
	TOTAL:				
	Number of medical baseline customers:	1774			
	Projected end date of weather event:	1200 hrs, 06/09			

Critical Infrastructure (including, but not limited to, hospitals, fire stations, police stations, water treatment facilities, schools, etc.)

County	Location(s)/Description of Infrastructure	Estimated Time of Restoration
Napa	2 Critical First Responder; 3 Telecom Infra; 6 Water Agencies	
Butte	16 Critical First Responder; 6 Telecom Infra; 7 Health Facilities; 24 Water Agencies; 57 Critical Schools; 82 Other Critical	
El Dorado	3 Critical First Responder; 2 Telecom; 3 Water; 2 Critical Schools; 5 Other Critical	
Nevada	1 Telecom; 8 Water; 5 Critical Schools; 5 Other Critical	
Placer	1 Critical First Responder	
Yuba	1 Telecom; 1 Water; 13 Critical Schools; 13 Other Critical	

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

Report Date:	6/8/2019	Report Time:	0800

Current Impact

County	Location(s)	# of Customers	Estimated Time of De-energization	Actual Time of De-energization	Estimated Time of Restoration
Napa	Napa(Un/Incorporated, Suisun City, Lake Berryessa, Napa)	1331		6/8 06:18	
Solano	Suisun City, Vacaville, Winters	192		6/8 06:18	
Yolo	Yolo (Unincorporated)	85		6/8 06:18	
TOTAL:					
Number of medical baseline customers:		1608			
Projected end date of weather event:		1200 hrs, 06/09			

Critical Infrastructure (including, but not limited to, hospitals, fire stations, police stations, water treatment facilities, schools, etc.)

County	Location(s)/Description of Infrastructure	Estimated Time of Restoration
Napa	2 Critical First Responder; 3 Telecom Infra; 6 Water Agencies	

CSWC Situation Cell

Public Safety Power Shutoff (PSPS) Notification Form

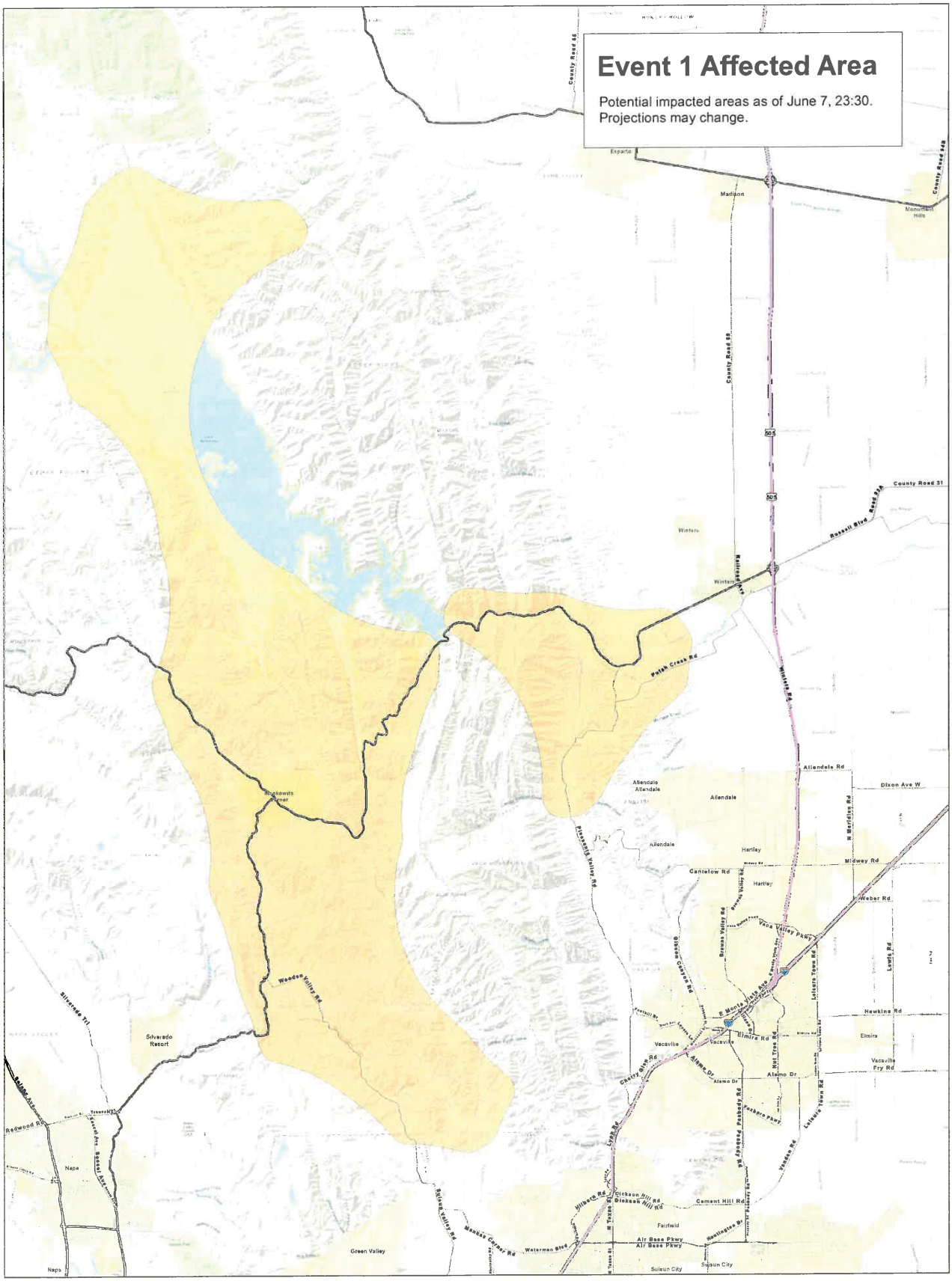
Report Date:	6/8/2019	Report Time:	0800

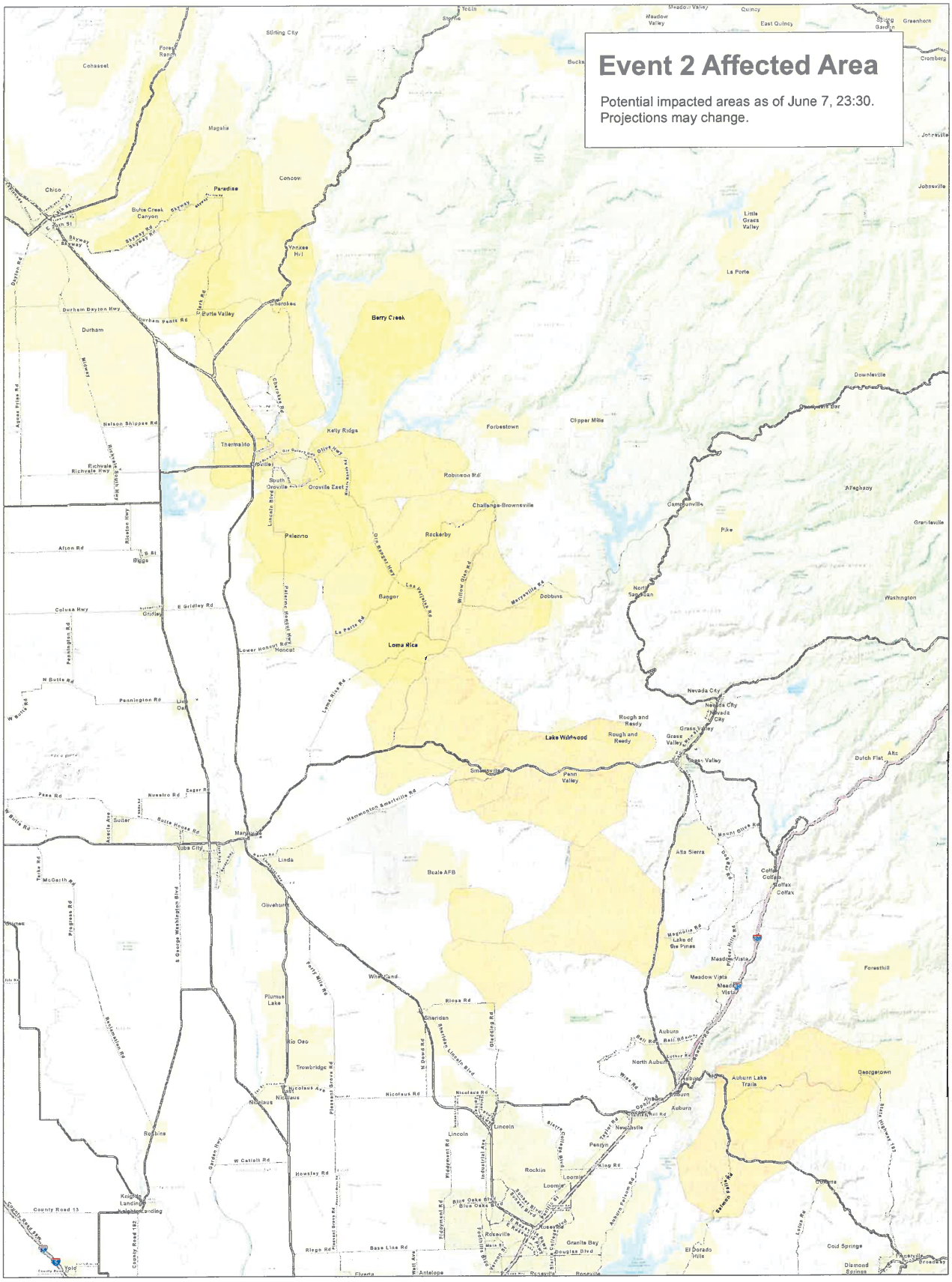
Public Notification Information

Proposed Public Notification Language (List by Customer Type)

Method of Public Notification (Check All That Apply)			
Automated Notification System: SMS/Text Message	✔	Automated Notification System: Voice Message/Phone	✔
Automated Notification System: Email	✔	Operator Conducted Phone Call	✔
Media Outreach	✔	Social Media	✔
Field Visit	✔	Local/Tribal Government Coordination	
Other – Please Specify:			

Entities to be Notified
to validate local/tribal Counties:


Event 1 Affected Area
Potential impacted areas as of June 7, 23:30.
Projections may change.
Esparto
Madison
Monument Hills
County Road 88
County Road 31
Russell Blvd
Winters
Putah Creek Rd
Allendale Rd
Allendale
Hartley
Midway Rd
Canfield Rd
Weber Rd
Vaca Valley Pkwy
Elmira Rd
Hawkins Rd
Vacaville
Alamo Dr
Cherry Glen Rd
Leisure Town Rd
Vacaville Fry Rd
Cement Hill Rd
Dickson Hill Rd
Fairfield
Air Base Pkwy
Suisun City
Green Valley
Napa
Silverado Resort
Redwood Rd
Silverado Trl
Wooden Valley Rd
Dixon Ave W
Lewis Rd
N Meridian Rd


Event 2 Affected Area
Potential impacted areas as of June 7, 23:30.
Projections may change.
Stirling City
Cohasset
Forest Ranch
Magalia
Paradise
Concow
Chico
Butte Creek Canyon
Yankee Hill
Cherokee
Durham
Durham Dayton Hwy
Durham Pentz Rd
Butte Valley
Berry Creek
Nelson Shippee Rd
Thermalito
Oroville
Kelly Ridge
Forbestown
Clipper Mills
Robinson Mill
Challenge-Brownsville
Palermo
Rackerby
Bangor
Dobbins
Loma Rica
Honcut
Lower Honcut Rd
Afton Rd
Biggs
Gridley
Colusa Hwy
E Gridley Rd
Pennington Rd
N Butte Rd
Live Oak
Pease Rd
Nuestro Rd
Sutter
Butte House Rd
Yuba City
Marysville
Linda
Beale AFB
Olivehurst
Plumas Lake
Wheatland
Sheridan
Rio Oso
Trowbridge
Nicolaus
Nicolaus Rd
Riego Rd
Howsley Rd
W Catlett Rd
Robbins
Knights Landing
County Road 13
Yolo
Base Line Rd
Antelope
Roseville
Granite Bay
Douglas Blvd
El Dorado Hills
Lincoln
Rocklin
Loomis
Penryn
Newcastle
Auburn
North Auburn
Auburn Lake Trails
Georgetown
Cool Springs
Placerville
Diamond Springs
Meadow Vista
Foresthill
Alta Sierra
Colfax
Grass Valley
Nevada City
Rough and Ready
Lake Wildwood
Penn Valley
Smartsville
Dutch Flat
Alta
Downieville
Forest City
Alleghany
Camptonville
Pike
Grizzly Flats
Washington
North Sacramento
Johnsville
Little Grass Valley
La Porte
Quincy
East Quincy
Meadow Valley
Greenhorn
Cromberg

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: PSPS Update - Additional Circuit in San Dimas for 11/08/18

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development
Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

From: Lewis, Benjamin
Sent: Thursday, November 8, 2018 3:47 PM
To: James Pasmore <James.Pasmore@sce.com>; Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Cc: Standi, John H. <JStandi@gswater.com>; Krebs, Leon <Leon.Krebs@gswater.com>
Subject: RE: PSPS Update - Additional Circuit in San Dimas for 11/08/18

Thanks for the notice. Can you also add Leon Krebs to the mailing list?

Ben

Benjamin Lewis, Jr. – General Manager Foothill District
Golden State Water Company, 401 South San Dimas Canyon Road, San Dimas, CA 91773
☎ Tel: 909.592.4271 ext 1401 🖷 Fax: 909.592.6690 📠 Email: benjamin.lewis@gswater.com

From: James Pasmore [mailto:James.Pasmore@sce.com]
Sent: Thursday, November 8, 2018 2:50 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>; Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Cc: Lewis, Benjamin <Benjamin.Lewis@gswater.com>; Standi, John H. <JStandi@gswater.com>
Subject: PSPS Update - Additional Circuit in San Dimas for 11/08/18

EXTERNAL EMAIL
Karla/All:

Another circuit has been added for the San Dimas area. Attached are the additional accounts that are potentially in scope.

Thank you.

James I Pasmore Jr, C.E.M
Key Accounts, Senior Advisor
Business Customer Division, Water Sector

T. 714-973-5759 | M. 714-227-3283

1325 S Grand Ave, Santa Ana, CA, 92705

SCE 24 Hour Emergency (800) 611-1911
www.sce.com/outages

Privacy Notice

Pegg, Pamela J.

From: Hancocks, Brandyn
Sent: Wednesday, September 25, 2019 9:33 AM
To: Pegg, Pamela J.
Subject: FW: Emergency Message from Southern California Edison (PSPS)

Brandyn Hancocks
Compliance Manager
Environment, Safety, Emergency Preparedness, Training & Development Golden State Water Company
3005 Gold Canal Drive, Rancho Cordova, CA. 95670
Phone: 916.853.3639 Cell: 916.719.9209 Fax: 916.852.0171
email: bhancocks@gswater.com

-----Original Message-----
From: Tejada, Karla
Sent: Friday, November 2, 2018 10:33 AM
To: Hancocks, Brandyn <Brandyn.Hancocks@gswater.com>
Subject: FW: Emergency Message from Southern California Edison (PSPS)

This is a formal PSPS notification of a potential shutdown. This was the first of a few messages that were sent from Edison on that Sunday when the winds started to pick up.

-----Original Message-----
From: do_not_reply@scewebservices.com [mailto:do_not_reply@scewebservices.com]
Sent: Sunday, October 14, 2018 3:05 PM
To: Tejada, Karla <Karla.Tejada@gswater.com>
Subject: Emergency Message from Southern California Edison (PSPS)

EXTERNAL EMAIL

This is an important message from Southern California Edison. We have begun exploring options for a potential public safety power shutoff in your area.
No power has been shut off at this time. We are identifying areas that might be affected by dangerous high winds. If you have any questions, please call our Call Center at 1-800-611-1911.

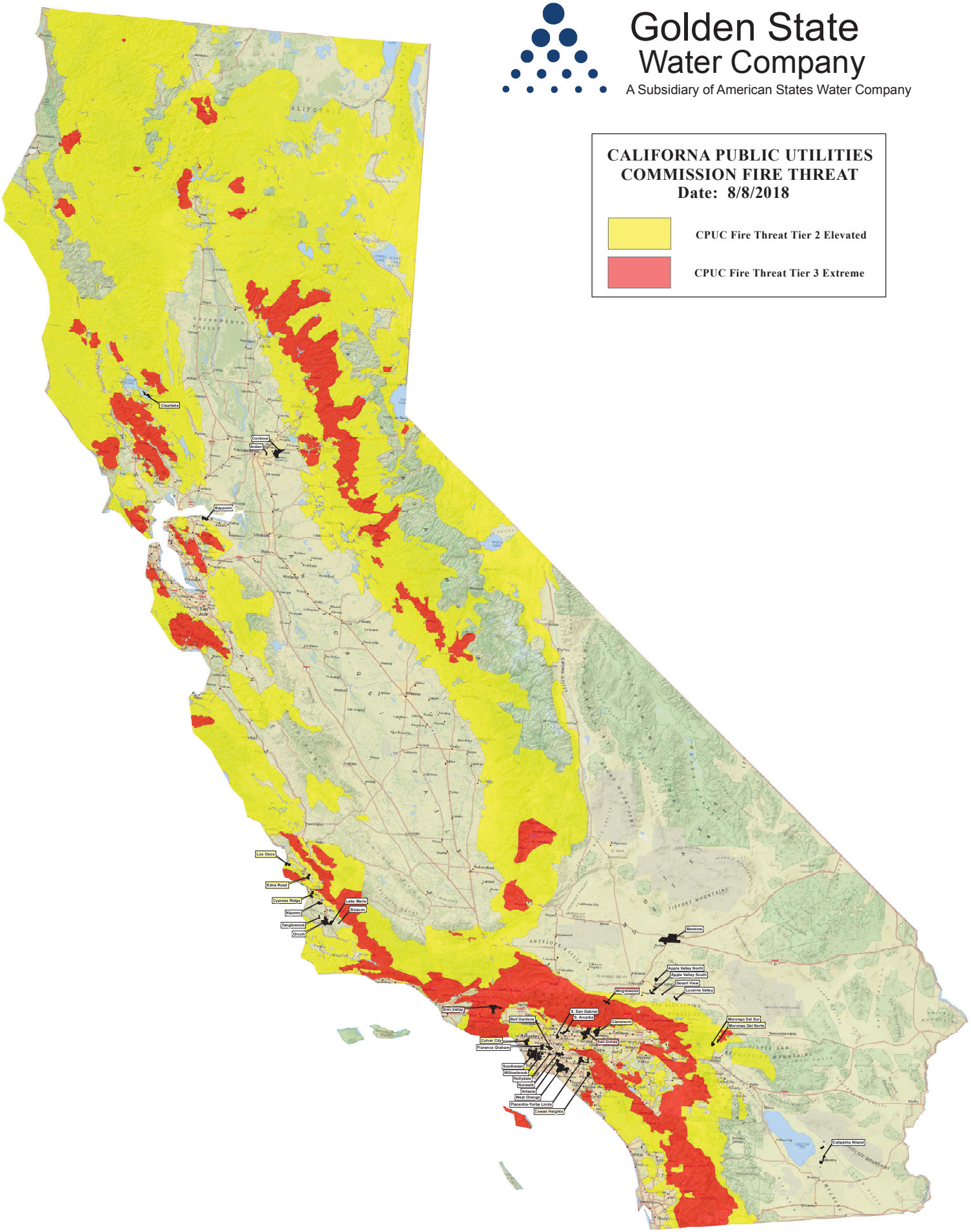
Thank you
Southern California Edison

ATTACHMENT Q

ATTACHMENT Q

Golden State Water Company

A Subsidiary of American States Water Company



ATTACHMENT R

FORSGREN Associates Inc.

TECHNICAL MEMORANDUM

Date: October 31, 2019
To: Larry Dees
From: Alan Driscoll, Brian Gach, Richard Noll
RE: **Engineering Study - Phase I: Survey & Scoping, Reservoir No. 4, Coloma WTP**

1. Introduction

This technical memorandum documents and presents the data from Phase I of an engineering study of the Golden State Water Company (GSWC) 5M-gallon welded-steel Reservoir No. 4 at the Coloma Water Treatment Plant (WTP), Rancho Cordova, California. GSWC commissioned this study to investigate a gap that has developed between the Reservoir and its ringwall foundation. Phase I was limited to a survey of the Reservoir. Phase II will include analysis of the survey data and development of potential engineering solutions to the problem.

2. Background

According to information provided by GSWC, Reservoir No. 4 was constructed between 2001 and 2002. Due to the large proportion of cobbles and relative lack of fines at the site, GSWC over-excavated and then placed backfill prior to pouring the concrete ringwall foundation. After construction, GSWC surveyed the ringwall foundation twice during 2002 to determine if any settling had occurred. No notable settling was observed, and the ringwall foundation was not surveyed again. Recently, GSWC observed that a gap had developed between the reservoir and its ringwall foundation. Suspecting that settlement of the ringwall foundation since 2002 may have caused the gap, GSWC asked Forsgren Associates, Inc. (Forsgren) for help. Specifically, we were asked to survey the ringwall foundation and compare the results to the 2002 survey results. The findings were to serve as the basis for Phase II of the study.

3. Planning

Based on this information, we solicited quotes from four firms to provide the surveying services. CTA Engineering & Surveying (CTA) was selected based on their previous experience at the Coloma WTP, along with their competitive pricing. We incorporated the CTA quote into a proposal to GSWC to coordinate and oversee the survey, to analyze the survey data, and to develop the scope for Phase II of the study. Prior to initiating the survey, we requested an opportunity to visit the site, to perform a general inspection of the reservoir, and to confirm the suitability of the proposed survey scope. The 2002 surveys measured the elevations of 44 specific points on the top of the ringwall foundation. We hoped to locate these points during our site visit in order to facilitate a comparison to the 2002 data.

4. Site Visit

We met with GSWC staff at the site on August 22, 2019. We observed and photographed the reservoir, the ringwall foundation, and the gap that had developed between them. We spoke with GSWC staff about the reservoir, its construction, and its history. We also looked for evidence of deformation or "oil-canning" of the reservoir that might be a symptom of any settling. Neither we nor GSWC staff were able to locate any evidence of the previously surveyed 44 points.

Based on observations from the inspection, we concurred that settling of the ringwall foundation might account for the observed gap. However, we were concerned that there could be other reasons. For example, we suggested that perhaps the ringwall foundation had not moved, and instead, the floor of the tank had settled. Accordingly, surveying only the ringwall foundation might not provide the information needed to address the problem. To account for other possible explanations, we requested and received permission from GSWC to perform a 3-D scan of the entire reservoir - including the ringwall foundation.

Since the 3-D scan would be more expensive than a conventional survey of just the ringwall foundation, it was agreed with GSWC that analysis of the survey data would be deferred to Phase II of the project.

5. Survey

Forsgren and CTA survey personnel met at the site on September 10, 2019 for orientation, to locate control points for the survey, and to perform the survey itself. GSWC had indicated that two monuments were located on the Coloma WTP property, but the survey team was not able to locate them. However, the CTA crew had performed work on the property in 2018 and were able to recover some of their previous control points. Details on the survey control are in the CTA report, included as Appendix A to this Tech Memo.

While setting up for the survey we realized that weeds growing around the reservoir would interfere with the survey. GSWC staff responded quickly to cut the weeds and stay ahead of the survey crew.

CTA utilized a Trimble SX10 Scanning Total Station with a 3-D positional accuracy of 2.5mm at 100m to perform the scan. Five separate stations (see Figure 2) were set up around the perimeter of the Reservoir in order to achieve full coverage of the Reservoir and the ringwall foundation. The survey crew arrived on site at 11:10am, completed the survey, and departed the site at 3:15pm.

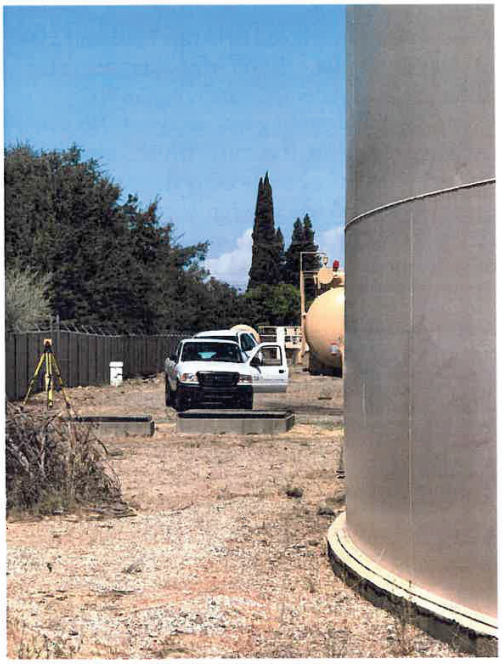


Figure 1 – Crew establishing control for survey.

Figure 2 – Survey Crew setting up for 3-D Scan.

6. Results

The result of the 3-D scan is a point-cloud with millions of data points, each with a 3-D positional accuracy of < 2.5mm. The point-cloud is illustrated in Figure 3, below, and the raw survey data have been submitted to GSWC in electronic format (flash drive). Limited post-processing was performed in order to confirm that the survey data for the ringwall foundation could be extracted and analyzed for comparison to the 2002 data. Since the 44 originally surveyed points were not able to be located, analysis of the 2019 data will be required to facilitate a reasonable comparison, as summarized in the following section.

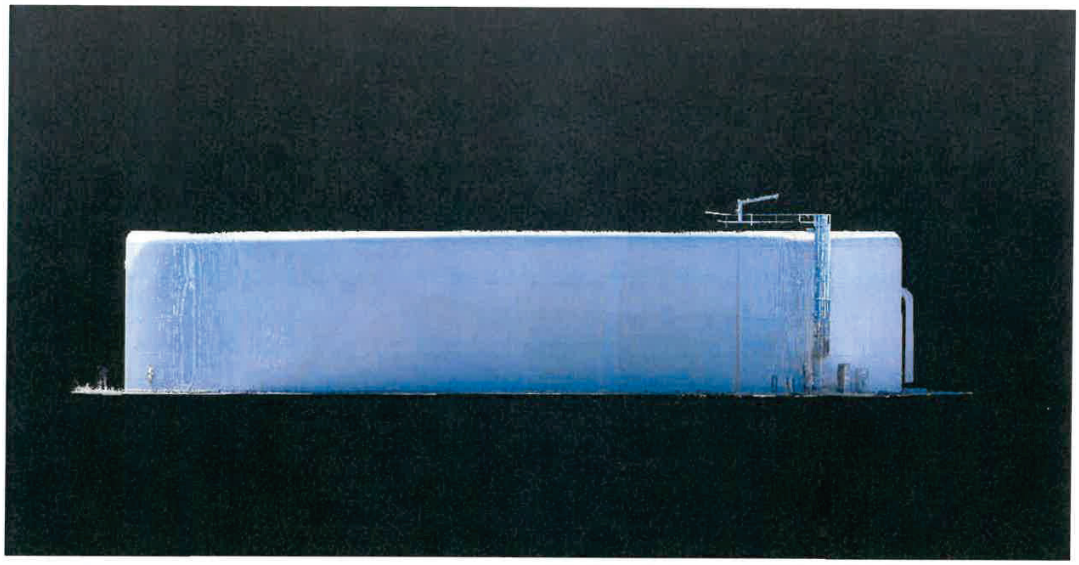


Figure 3 – Point-cloud representation of Coloma WTP Reservoir No. 4.

7. Recommended Scope for Phase II

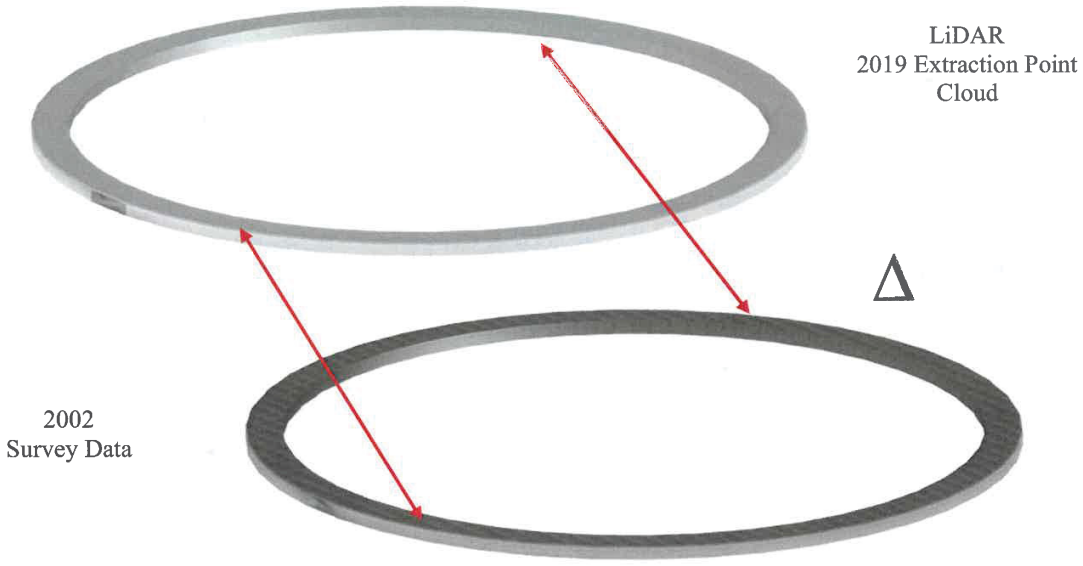
Phase II of the study will have three objectives:

1. Compare 2019 survey data to 2002 data to determine if ringwall foundation has settled.
2. Evaluate steel portion of Reservoir in order to determine if deformation has occurred.
3. Assess severity of problem, and recommend potential solutions.

Specific steps for each of these tasks are summarized below:

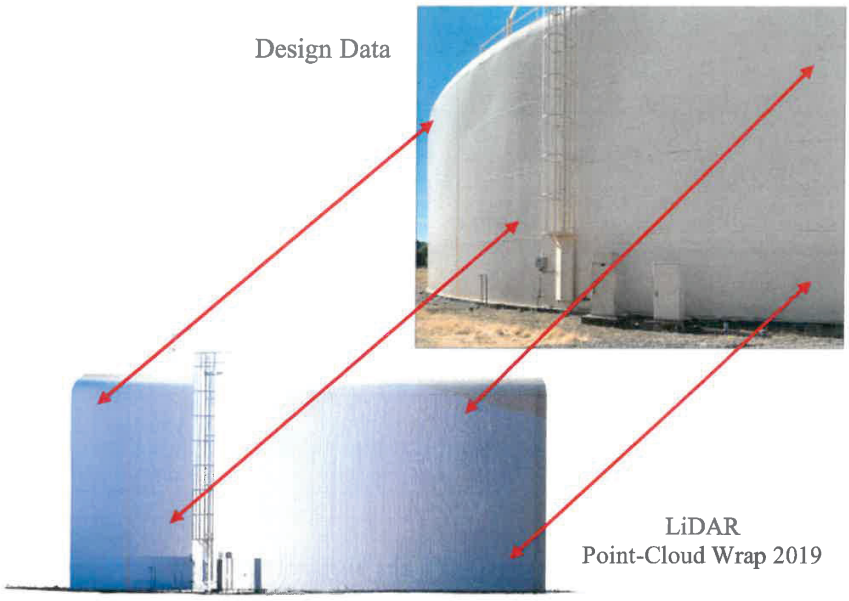
Task 1 – Compare Ringwall Data

a. Input 2002 survey data to ACAD (manually)
b. Extract ringwall survey data from 2019 LiDAR data and model in ACAD
c. Integrate / adjust point-set to approximate location match to 2002 point-set
d. Analyze and normalize data vertically and radially for accurate comparison
e. Compare/contrast data to determine differences, if any, between 2002/2019 survey
f. Characterize results
    i. Text summary
    ii. Visual representation



Task 2 – Evaluate Tank Shell

a. Model shell design/as constructed in ACAD for base
b. Impose LiDAR point-cloud upon base model (ACAD)
c. Analyze base/point cloud interface:
    i. 3 axis (x, y, z), 360° continuously integrated approach (i.e., "CT Scan")
        1. Horizontal slices
        2. Vertical slices
    ii. Evaluate
        3. Deltas (+/-) in shell models for:
            a. Negligible construction variance
            b. Horizontal deformation
            c. Vertical "canning"
d. Characterize results
    i. Text summary
    ii. Visual depiction



Task 3 - Summary and Recommendations

a. Executive Summary
b. Phase III Technical Approach
c. Phase III Estimated Cost

END

ATTACHMENT S

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CORROSION REPORT

PROJECT:	Corrosion Engineering Evaluation of a Buried Concrete Water Storage Reservoir
STRUCTURE:	200,000 Gallon Buried Concrete Water Storage Reservoir (Edna Reservoir)
OWNER:	Golden State Water Company
LOCATION:	San Luis Obispo, California
INVESTIGATED BY:	David Ashton, Engineer Technician
REPORT BY:	Andre Harper, Project Engineer
DATE:	April 2019

I. GENERAL INFORMATION

A. Construction and Maintenance Details

Structure is a buried Hypalon lined reservoir located in San Luis Obispo, California, and is designated as the Edna Reservoir. The date of construction of the reservoir was listed as 1998 in the State Water Resources Control Board report dated February 6, 2019. The date the liner was installed is unknown. The reservoir is approximately 60 ft. by 60 ft. by 10 ft. deep.

B. Site Conditions

The reservoir is located adjacent to a golf course and is covered with dirt and vegetation. Access to the site is off a paved access road through the golf course. There is vehicle access adjacent to the roof hatch. No difficulty is anticipated for Contractor mobilization, assuming use of normal portable air compressor and related equipment.

C. Existing Coating and Paint Systems

1. The field investigation and file data indicate the exterior and interior surfaces to be the following:

a. Exterior Surfaces

1) All steel piping and appurtenances appear to be painted carbon and/or galvanized steel.

2) Exterior concrete surfaces could not be evaluated due to the buried condition.

b. Interior Surfaces

1) The roof, columns, and upper 2 feet of the walls appear to be coated with an epoxy coating system.

2) The lower 8 feet of the walls, lower 2 feet of the columns, and the floor are covered with a Hypalon liner material.

3) The interior ladder is galvanized steel and the inlet/outlet and overflow are coated carbon steel.

D. Cathodic Protection System

No cathodic protection system is currently installed in this reservoir for the appurtenances.

E. Title 22 Heavy Metal Analyses

No samples of interior coatings or exterior paint were removed during the evaluation for analyses for the presence of heavy metals, as this was not included in the scope of work for the project.

F. Contract Information

Harper & Associates Engineering, Inc. was retained by the Water Company to accomplish field investigation to observe interior and exterior surfaces and conditions, with photographs taken to record conditions. This report has been prepared with remedial repair or liner replacement recommendations and cost estimates for accomplishing the work.

This Corrosion Report is prepared solely on the basis of noted field investigation. Conclusions and recommendations are strictly those determined by Consultant to be consistent with the best and most experienced practice within the corrosion engineering profession.

II. INVESTIGATION

A. Investigation was accomplished as follows:

1. Exterior Surfaces

a. Investigation of the roof hatch and appurtenances was accomplished by traversing the site at ground level around the reservoir.

b. No evaluation could be accomplished of the exterior concrete surfaces due to the buried condition.

c. Photographs were taken of typical and specific areas to illustrate condition of surfaces.

2. Interior Surfaces

a. Underside of the roof and appurtenances were inspected by floating the reservoir in an inflatable raft and systematically traversing the roof and walls above the waterline.

b. Surfaces below the waterline were investigated by diving the reservoir and traversing the walls, floor, and perimeter of the reservoir.

c. Light was supplied via high intensity portable light and natural light from the roof hatch.

d. Photographs were taken of typical and specific areas to illustrate condition of surfaces.

III. OBSERVATIONS

A. Based upon the above reported investigation, the following observations were noted:

1. Exterior Surfaces

a. Roof Hatch and Appurtenances

1) The exterior concrete surfaces could not be evaluated due to the buried condition. (Photo E-1)

2) Delaminating paint is present on the roof vent cover and neck. (Photos E-2 and E-3)

3) Delaminating paint and minor corrosion are present on the galvanized hatch cover and curb. (Photos E-4 and E-5)

4) Moderate corrosion is present on the hatch hardware and supports for the cover. (Photos E-5, E-6, and E-9)

5) Moderate to severe corrosion is present on the nuts and bolts securing the ladder to the wall. (Photo E-8)

2. Interior Surfaces

a. Underside of Roof, Columns, and Upper Walls

1) The coating system on the underside of the concrete roof, upper walls, and columns is in generally good condition with random bugholes and holidays present. (Photos I-1 through I-7)

2) Isolated spots of corrosion are present on the roof. (Photos I-4 and I-5)

3) Blistered coating is present on the columns above and below the waterline. (Photos I-7 through I-10 and I-32 through I-38)

4) The nuts and bolts securing the liner to the upper walls are severely corroded. (Photos I-11 through I-15)

5) The coating system on the overflow pipe is delaminating with severe corrosion and rust scale present. (Photos I-16 through I-18)

b. Liner and Appurtenances

1) The Hypalon liner appears to be in overall poor condition with numerous wrinkles, folds, repairs, and failing repairs present. (Photos I-20 through I-48)

2) Minor corrosion and oxidation are present on the galvanized ladder below the top capacity level. (Photos I-20 through I-23)

3) A white residue is present randomly on the liner at the junctions of the seams. (Photos I-24 and I-25)

4) The liner is wrinkled, loose, and pulling away from the concrete randomly on the walls and floor. (Photos I-27 through I-31 and I-39 through I-45)

5) The liner is in poor condition and is poorly secured to the lower columns. (Photos I-35 through I-38)

6) Random seams appear to be poorly bonded and exhibit signs of coming loose. (Photo I-38)

7) White patching material is present along random seams and at random patches. (Photo I-43)

8) Minor corrosion is present at the upper circumference of the inlet/outlet pipe. (Photo I-48)

3. Safety, Health, and Code Features

a. The interior ladder does not provide the minimum toe clearance.

IV. CONCLUSIONS

A. Based on the above noted observations, the following conclusions are drawn:

1. Exterior Surfaces

a. Roof Hatch and Appurtenances

1) Delaminating paint on the roof vent and hatch and curb appears to be

due to a combination of the age of the paint system and possibly not properly preparing the galvanized surfaces prior to painting.

2) Corrosion of the hatch hardware and nuts and bolts securing the ladder to the wall appears to be due to utilizing carbon steel hardware that does not perform well in the presence of the warm moist air exhausting through the hatch.

2. Interior Surfaces

a. Underside of Roof, Columns, and Upper Walls

1) Holidays in the coating system are typically due to either not applying sufficient mil thickness or the concrete outgassing during and after applying the coating system.

2) Bugholes are a typical condition on concrete surfaces within reservoirs and usually do not present any problems in the concrete. Problems develop if the bugholes cause insufficient coverage of concrete over the reinforcing steel, causing it to corrode.

3) Isolated spots of corrosion on the roof are due to a combination of holidays in the coating system and bugholes in the concrete causing insufficient coverage of concrete over the reinforcing steel.

4) Blistered coating on the columns appears to be due to moisture getting behind the coating system through the many bugholes and holidays.

5) Severely corroded nuts and bolts securing the liner to the walls appears to be due to utilizing carbon steel nuts and bolts to secure the flat bars to the walls.

6) Severe delamination and corrosion on the overflow pipe appear to be due to the age of the coating system.

b. Liner and Appurtenances

1) The poor condition of the Hypalon liner appears to be due to the age of the liner. The liner appears to have been patched in numerous locations during previous maintenance intervals with varying degrees of success.

2) Minor corrosion and oxidation on the galvanized ladder are typically due to imperfections in the original galvanizing process and mechanical damage from climbing the ladder.

3) The white residue on the liner at the junctions of random seams appears to be leftover patching material that failed to adhere properly.

4) The wrinkled and loose liner appears to be due to water getting behind the liner and pushing it away from the walls and floor. The large lifted area on the floor noted in the Photographic Survey is over 15 feet wide.

5) The poor condition of the liner at the lower columns appears to be due to a combination of the original installation and failed attempts to patch and/or resecure the liner to the columns.

6) White patching material at random seams and patches appears to be due to attempting to stop leaks that may have been previously identified.

7) Minor corrosion at the upper circumference of the inlet/outlet pipe is due to insufficient coverage of concrete along the upper edge.

3. Safety, Health, and Code Features

a. Ladders without proper toe clearance are not in compliance with Cal/OSHA Regulations.

V. RECOMMENDATIONS

A. Based on the above noted observations and conclusions, the following recommendations are offered:

1. Exterior Surfaces

a. The corroded hatch hardware and nuts and bolts should be replaced with galvanized components.

b. Very little corrosion is present on the roof vent and hatch, as both appear to be galvanized. Therefore, painting these items is not necessary but would be for aesthetic purposes only. If desired by the Company, the painting could be accomplished at the time the interior work is accomplished. The failing paint could also be removed to expose the galvanized finish.

2. Interior Surfaces

a. Due to the age of the Hypalon liner and overall poor condition, HAE does not recommend attempting to repair the liner. The State Water Resources Control Board report dated February 6, 2019 noted removing the liner and coating the interior of the reservoir with an epoxy coating. However, the reason the liner was installed originally is unknown. It may be possible to coat the interior concrete surfaces but, until the liner is removed and the surfaces evaluated, the feasibility of coating the concrete cannot be confirmed.

1) If it is determined the concrete can be coated, HAE would recommend coating the interior concrete walls, columns, and floor surfaces with an epoxy or urethane coating system with a minimum

thickness of 125 mils. In addition to coating, the following repairs may be needed prior to coating the concrete.

(a) If large cracks are present, they should be thoroughly cleaned by brush-off blast cleaning or high-pressure water blast cleaning, chipping, grinding, etc. Cracks should be injected with flexible polyurethane and an approved injection procedure.

(b) Isolated corrosion spots should be cleaned by brush-off blast cleaning, chipping, grinding, etc., and repaired with a cementitious material.

(c) Any joint sealants should be removed and the joints abrasively blast cleaned to remove all sealant residue and loose concrete. The joints should then be filled with a polyurethane elastomeric sealant.

2) If it is determined the concrete cannot be coated, HAE recommends replacing the existing liner with a new 45 mil thick Hypalon liner.

b. The overflow pipe should be abrasive blast cleaned to Near White Metal (SSPC-SP10) and a three-coat epoxy coating system should be applied to a minimum total dry film thickness of 15.0 mils.

c. If a new liner is installed, the blistered coating on the columns will continue to deteriorate over time and will eventually start falling off the columns and contaminate the water supply. The failed coating should be removed from the columns and any areas of corrosion on the columns should be repaired with a cementitious repair material.

d. Minor corrosion at the upper circumference of the inlet/outlet pipe should be power tool cleaned and coated with an epoxy coating.

3. Safety, Health, and Code Features

a. The interior ladder should be replaced with a new ladder and installed to meet the minimum required toe clearance.

VI. COST ESTIMATES

A. Based on current and previous projects of similar scope, preliminary cost estimates for work as noted in RECOMMENDATIONS were calculated by using data from those projects.

1. Exterior Surfaces

a. Replacing the corroded hatch hardware and nuts and bolts securing the interior ladder would be in the cost range of $1,500 to $2,400.

2. Interior Surfaces

a. Removal and disposal of the existing liner would be in the cost range of $9,000 to $11,500.

b. Replacing the existing liner with a 45 mil Hypalon liner would be in the cost range of $58,500 to $65,000.

1) If a new liner is installed, it is recommended to remove the failed coating from the columns, which would be in the cost range of $6,500 to $8,400.

c. Coating the interior concrete walls, columns, and floor surfaces with an epoxy or urethane coating system with a minimum thickness of 125 mils would be in the cost range of $80,000 to $115,500.

d. If determined necessary prior to coating the concrete, the costs for the following repairs would apply.

1) Brush-off blast cleaning or high-pressure water blast cleaning, chipping, grinding, etc., large cracks and injecting with flexible polyurethane would be in the cost range of $18 to $20 per linear foot.

2) Repairing random corrosion spots would be in the cost range of $25 to $30 per spot, if work is accomplished with coating work.

3) Removing the existing joint sealants and installing new joint sealants would be in the cost range of $20 to $25 per linear foot.

e. Abrasive blast cleaning the overflow pipe, power tool cleaning the upper edge of the inlet/outlet pipe, and applying an epoxy coating would be in the cost range of $7,500 to $9,800, based on work being accomplished when the liner is replaced or concrete coated. This cost would also include painting the exterior vent and hatch cover.

3. Safety, Health, and Code Features

a. Replacing the interior ladder would be approximately $2,500 to $3,500.

Respectfully submitted,

HARPER & ASSOCIATES ENGINEERING, INC.

Andre Harper
Project Engineer

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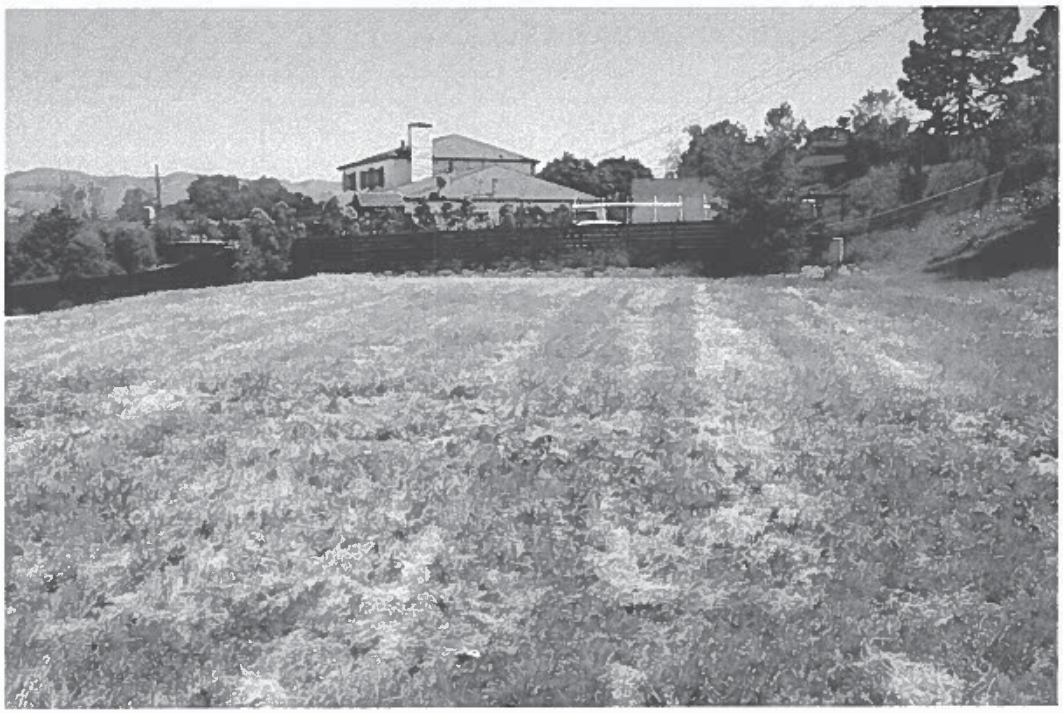
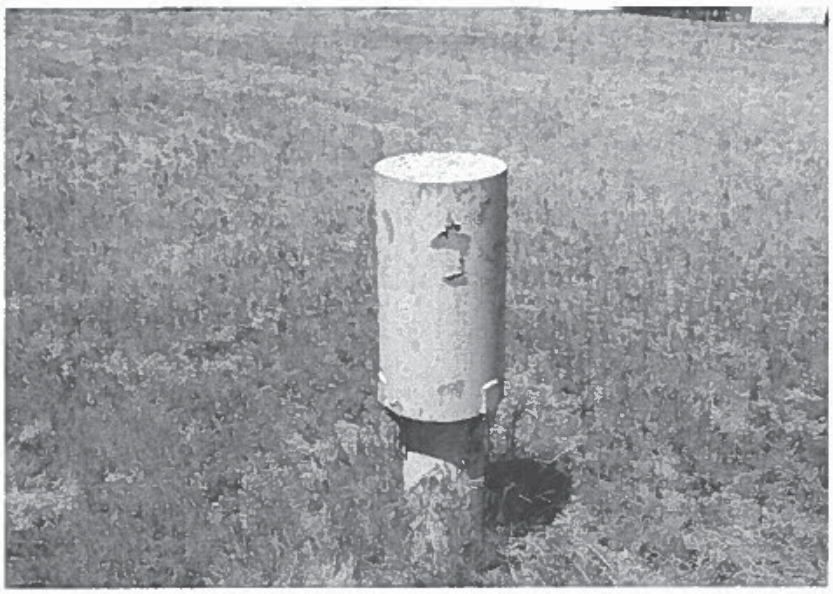
PHOTOGRAPHIC SURVEY

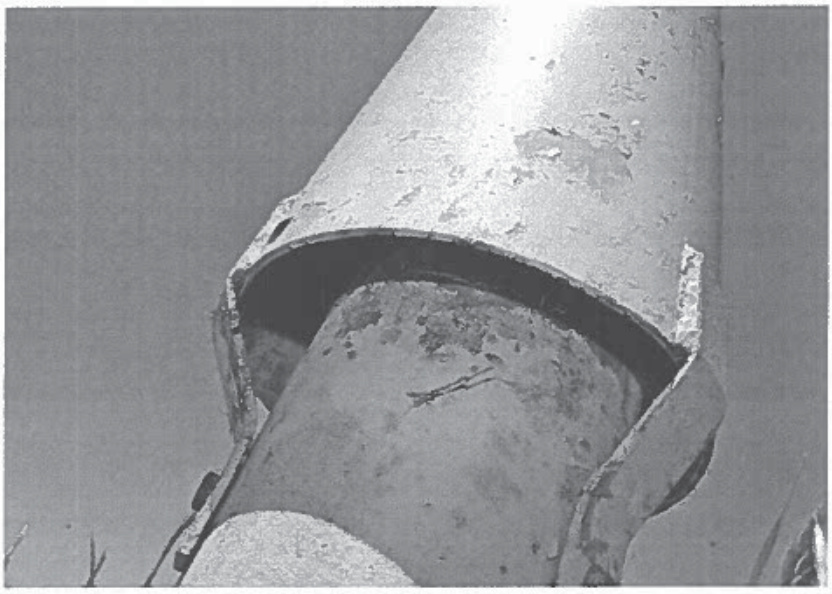
PROJECT:	Corrosion Engineering Evaluation of a Buried Concrete Water Storage Reservoir
STRUCTURE:	Exterior of the 200,000 Gallon Buried Concrete Water Storage Reservoir (Edna Reservoir)
OWNER:	Golden State Water Company
LOCATION:	San Luis Obispo, California
PHOTOGRAPHED BY:	Brandon Baxter, Engineer Technician
DATE:	April 2019

E-1 View of the Edna Reservoir site, illustrating dirt and vegetation covering the roof of the reservoir.

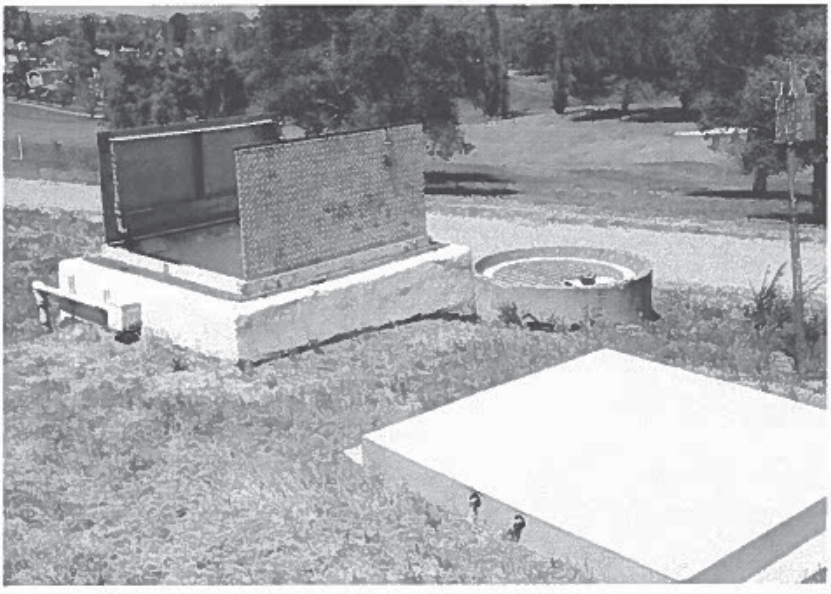




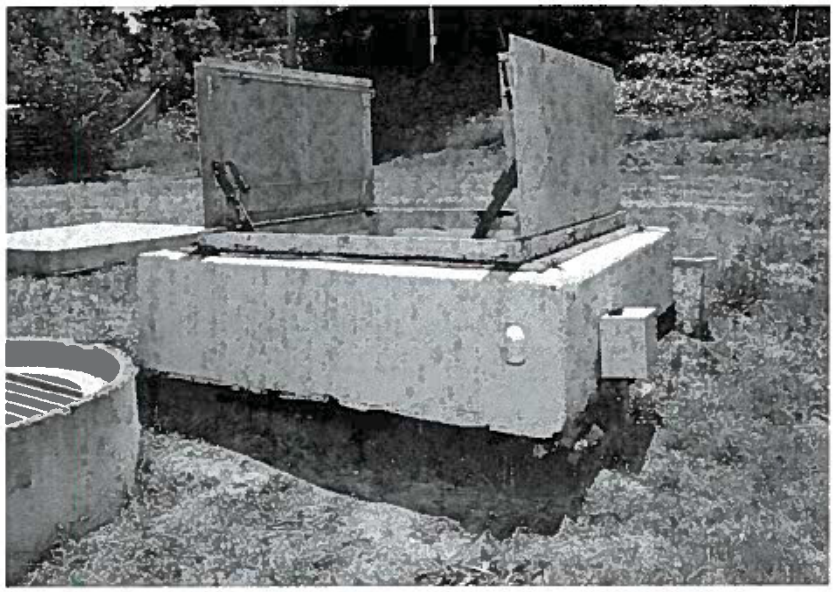
E-2 View of a roof vent, illustrating delamination of the paint system on the vent cover.



E-3 View of the vent neck and brackets supporting the cover, illustrating the generally poor condition of the paint system.



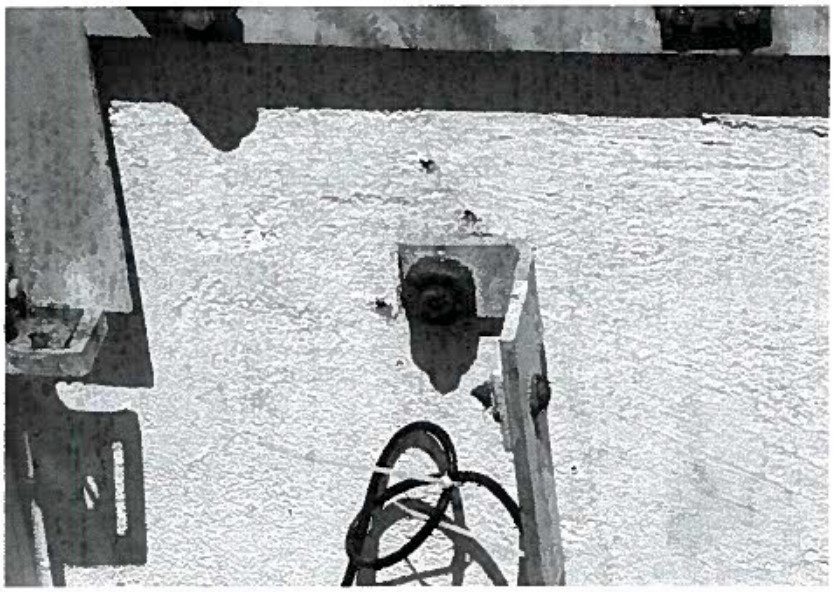
E-4 View of the roof hatch, illustrating minor corrosion on the galvanized cover.



E-5 Same as Photo E-4, except from a different angle. Note delaminating paint on the galvanized curb.

E-6 View of the roof hatch and interior ladder, illustrating moderate corrosion on the hatch cover supports and nuts and bolts securing the top of the ladder.

E-7 View of the ladder above the waterline, illustrating generally good condition of the galvanized ladder.



E-8 Close-up view of a ladder stand-off bracket, illustrating moderate to severe corrosion of the nuts and bolts securing the ladder.

E-9 View of a hatch cover support bracket, illustrating moderate corrosion on the bracket.

E-10 View of the overflow access, illustrating minor staining on the concrete and good condition of the grate.

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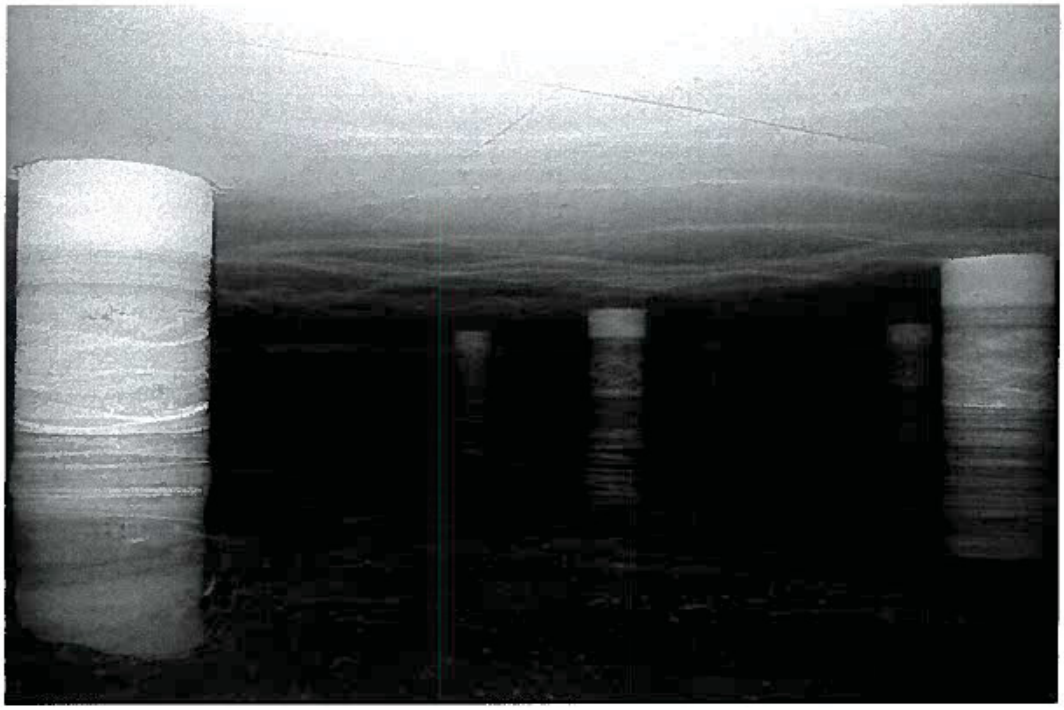
PHOTOGRAPHIC SURVEY

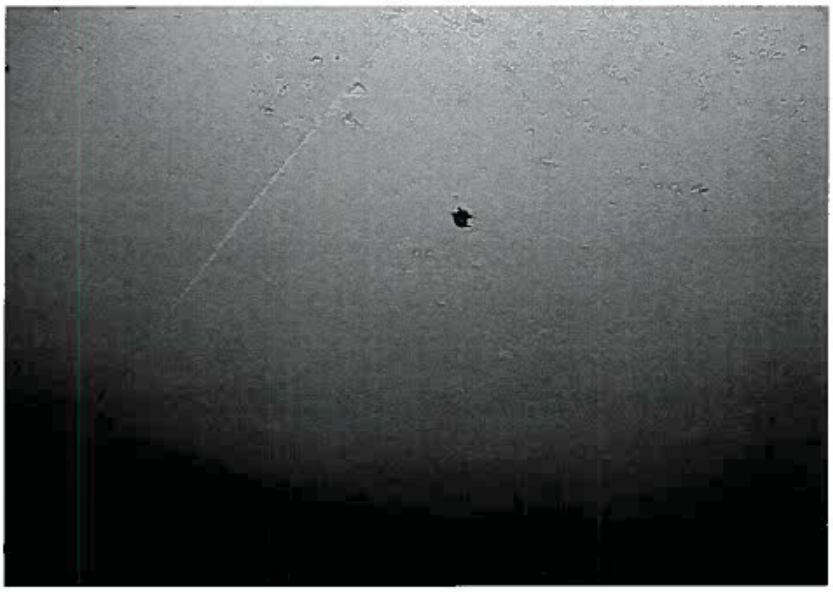
PROJECT:	Corrosion Engineering Evaluation of a Buried Concrete Water Storage Reservoir
STRUCTURE:	Interior of the 200,000 Gallon Buried Concrete Water Storage Reservoir (Edna Reservoir)
OWNER:	Golden State Water Company
LOCATION:	San Luis Obispo, California
PHOTOGRAPHED BY:	David Ashton, Engineer Technician
DATE:	April 2019

I-1 View of the roof and columns above the waterline, illustrating good condition of the coating system on the roof and upper columns.



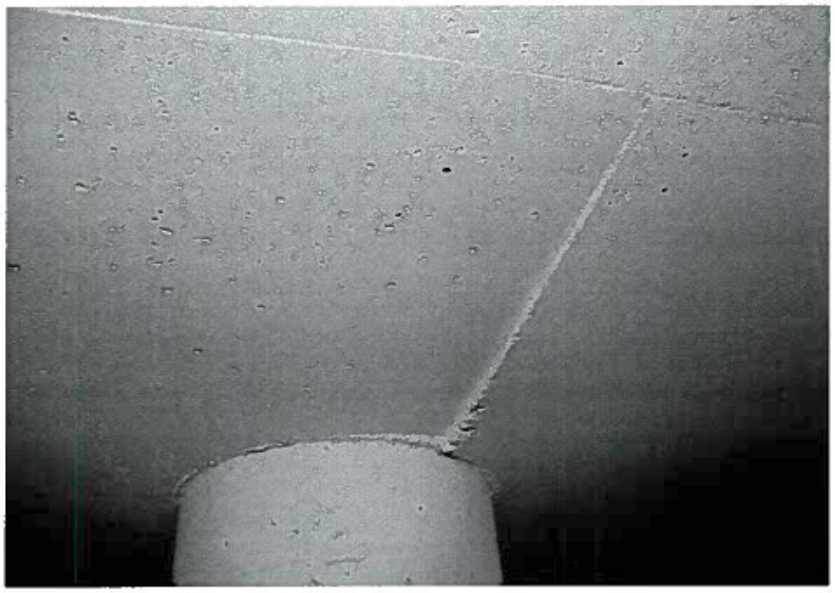
I-2 View of a portion of the roof, illustrating form debris at the joints and otherwise good condition of the coating system. Note light brown staining on the columns in the water fluctuation zone.

I-3 Same as Photo I-2, except a different portion of the roof. Note bugholes and minor spalling.

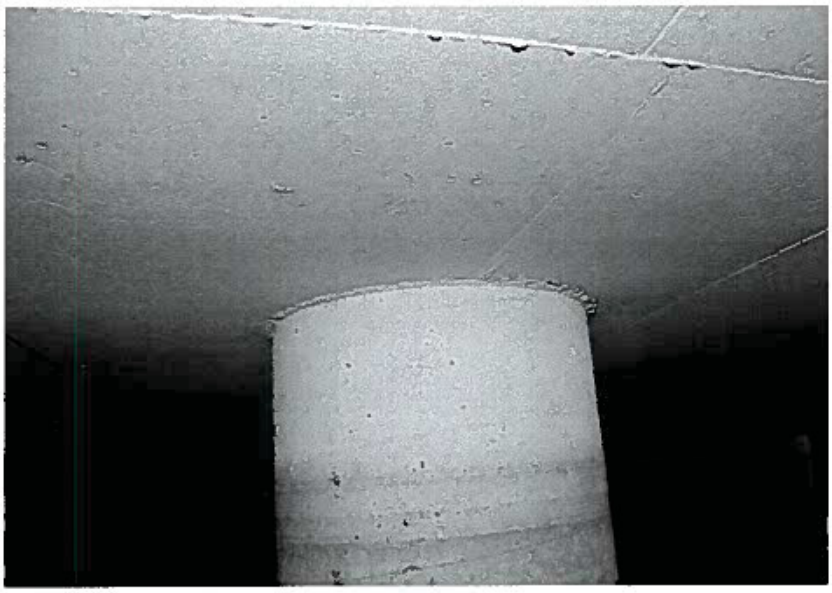


I-4 Close-up view of the roof, illustrating a spot of corrosion and otherwise good condition of the coating system.

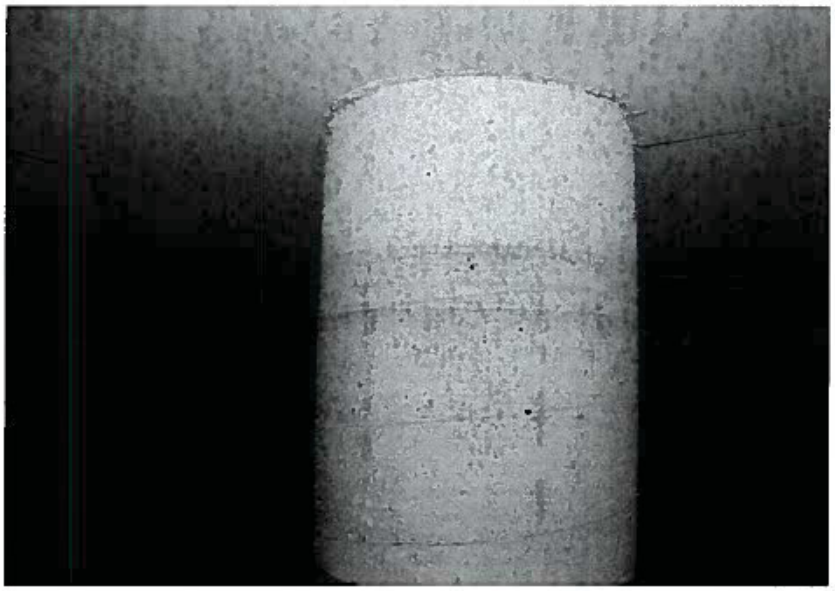
I-5 Close-up view of the roof, illustrating a spot of corrosion, bugholes, and holidays in the coating system.



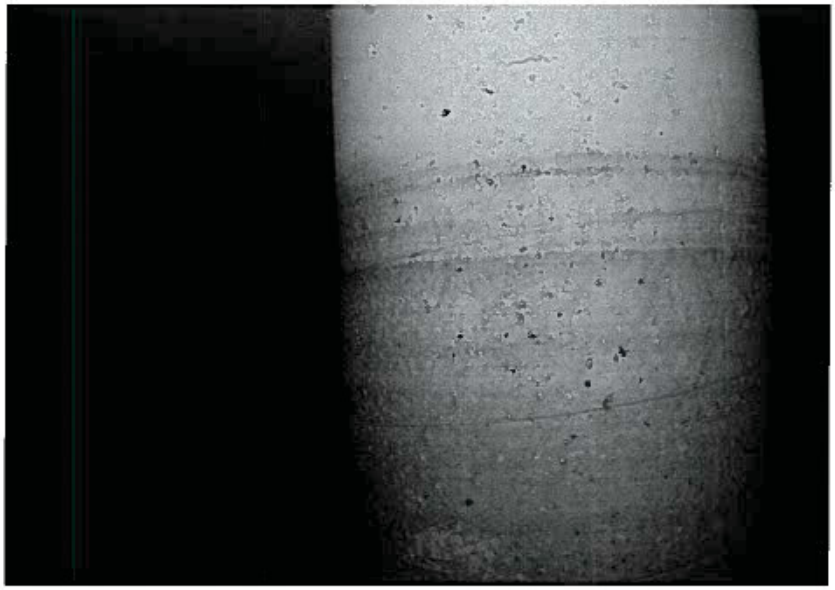
I-6 View of a roof to column transition, illustrating generally good condition of the coating system.



I-7 Same as Photo I-6, except in a different location.

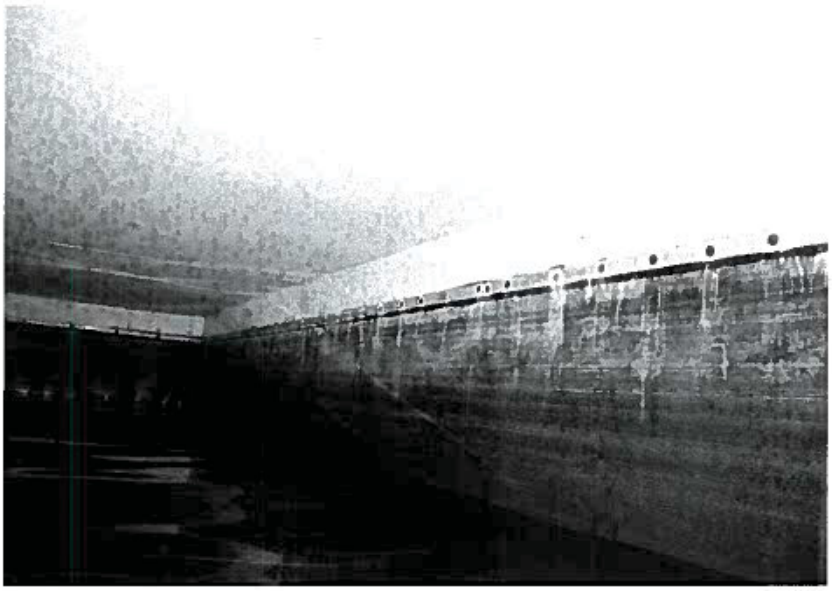


I-8 Same as Photos I-6 and I-7, except in a different location. Note blistering of the coating system on the column in the water fluctuation zone.

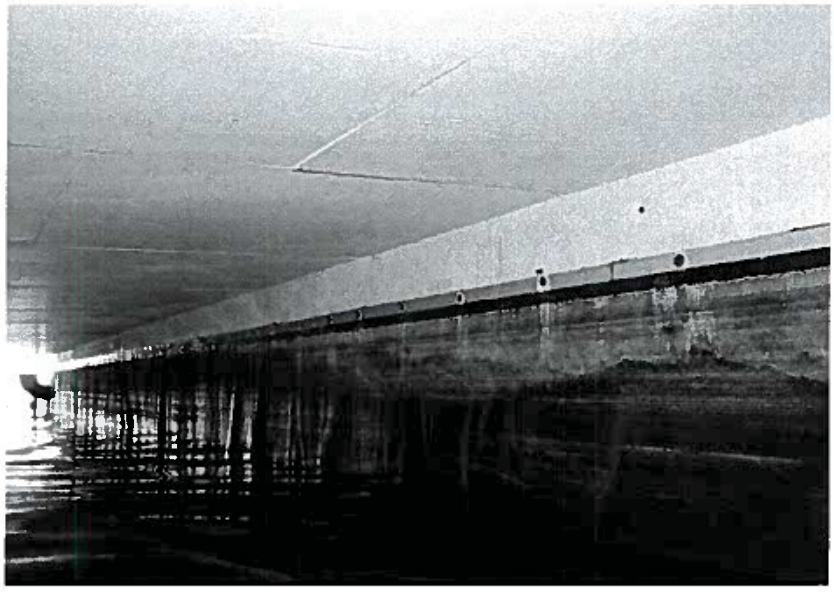


I-9 Close-up view of a column, illustrating the blistered coating system in the water fluctuation zone.

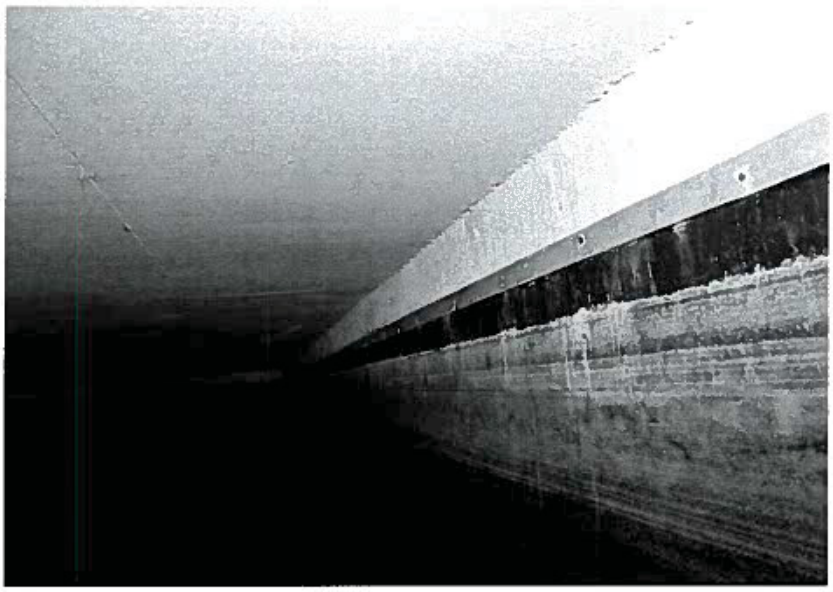
I-10 Same as Photo I-9, except in a different location. Note random spots of corrosion.



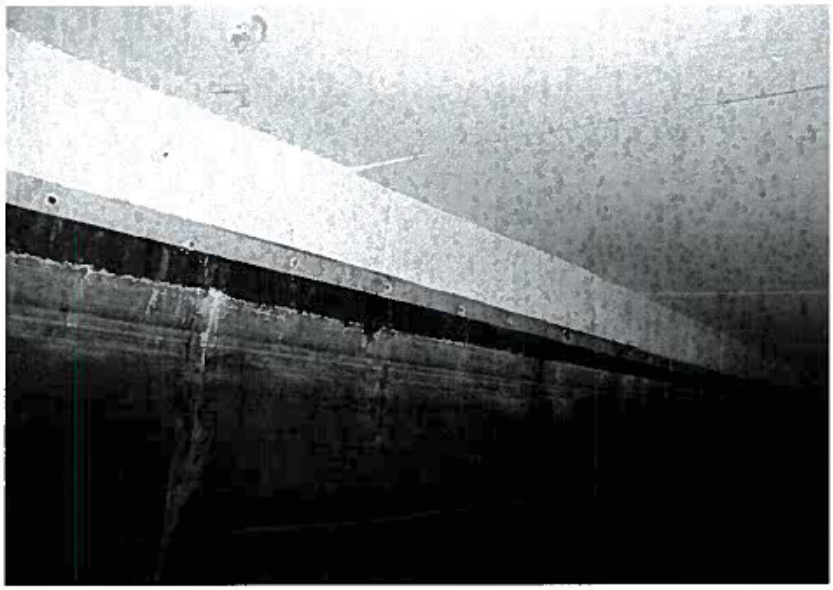
I-11 View of roof to wall transitions, illustrating good condition of the coating system on the roof and upper walls, and corrosion of the nuts and bolts securing the liner to the walls.



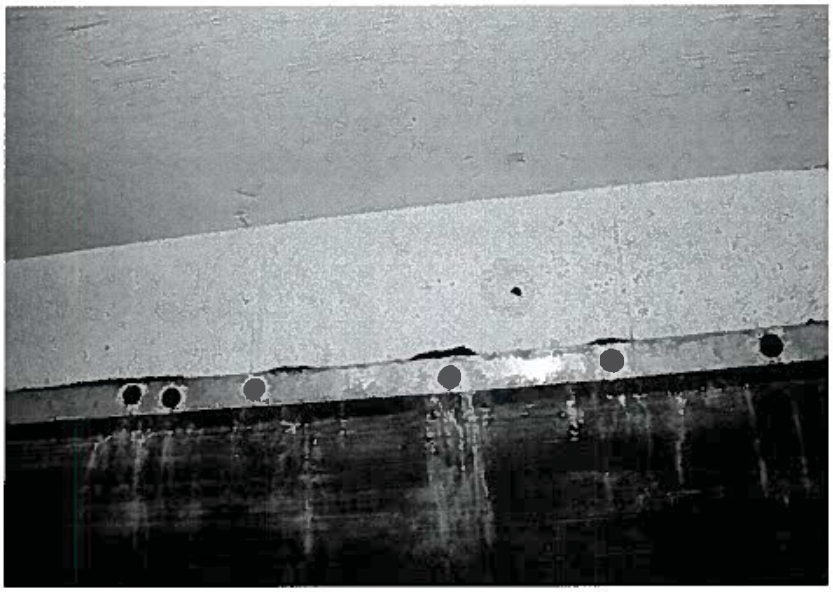
I-12 Same as Photo I-11, except in a different location. Note staining and wrinkles in the liner.



I-13 Same as Photos I-11 and I-12, except in a different location.

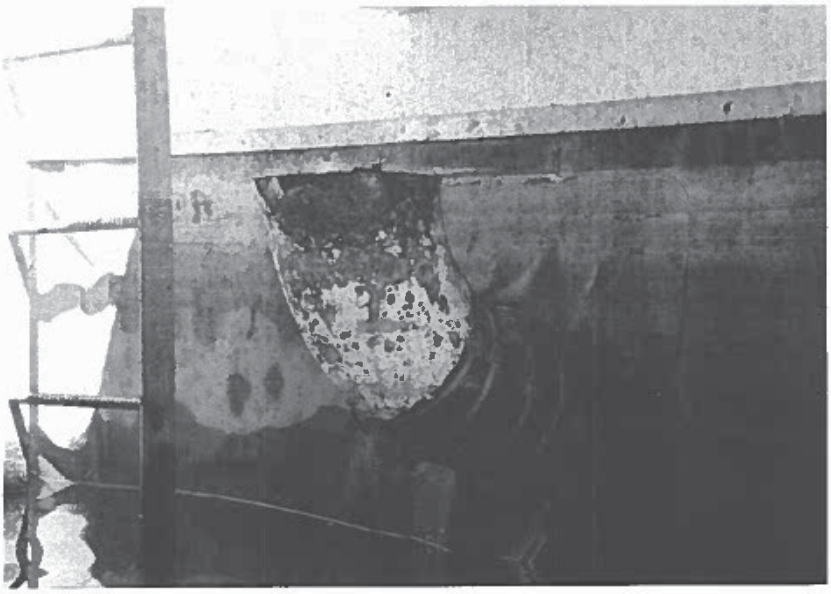


I-14 Same as Photos I-11 through I-13, except in a different location. Note random brown stains on the roof and wall.



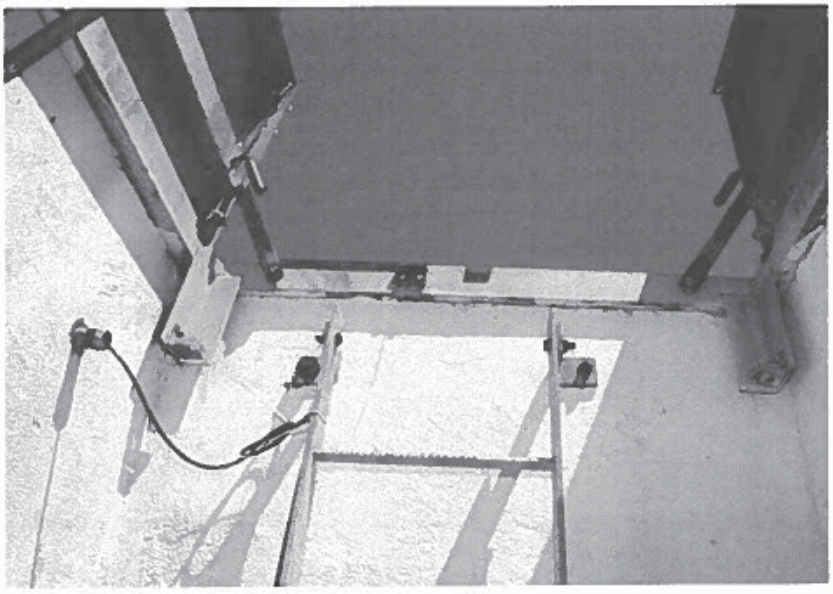
I-15 View of the top of the liner attached to a wall, illustrating severe corrosion of the nuts and bolts securing the liner. Note a spall on the wall with a spot of corrosion present at the center of the spall.

I-16 View of the ladder and overflow pipe, illustrating moderate to severe corrosion on the pipe and good condition of the galvanized ladder.

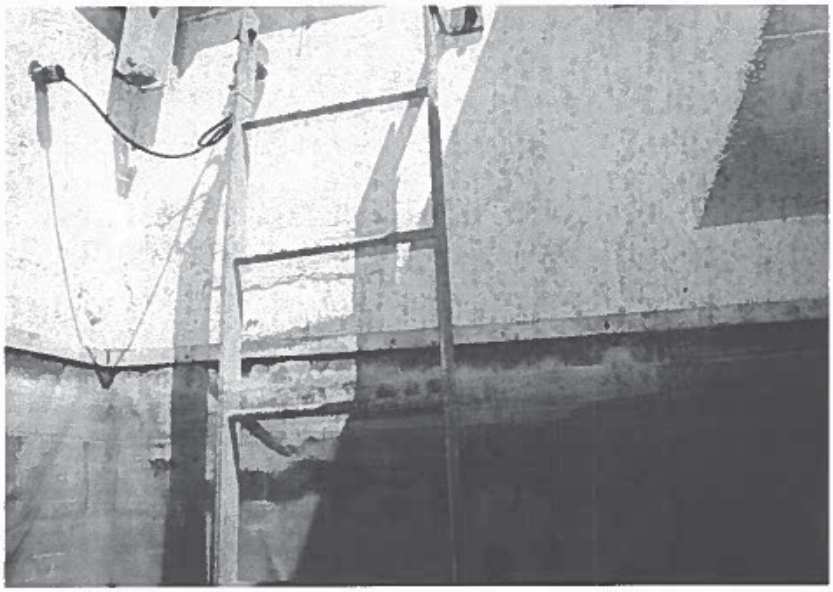


I-17 Close-up view of the overflow pipe, illustrating severe corrosion and delaminating coating.

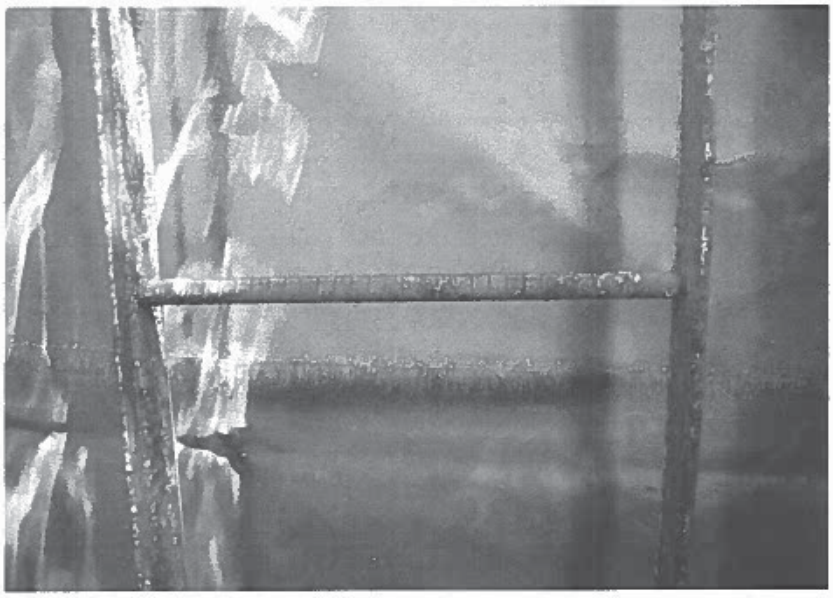
I-18 Same as Photo I-17, except from a different angle.



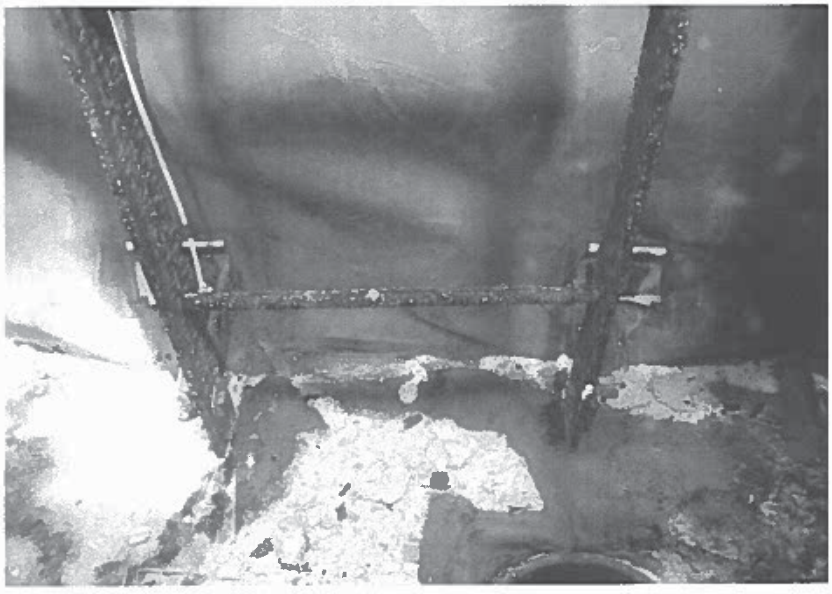
I-19 View of the roof hatch and ladder, illustrating moderate corrosion on the cover supports, ladder nuts and bolts, and adjacent abandoned brackets.



I-20 View of the ladder just above the waterline, illustrating good condition of the ladder and staining on the adjacent liner.



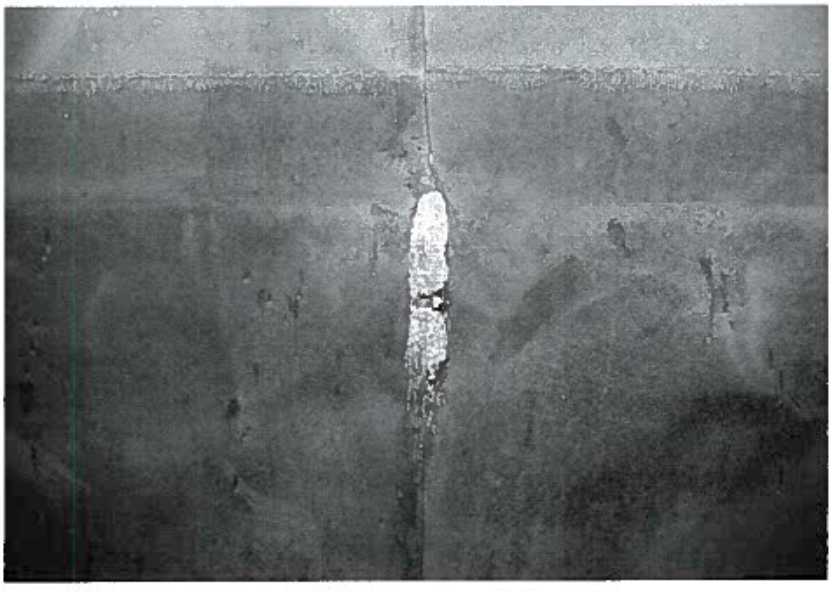
I-21 View of the ladder just below the waterline, illustrating minor oxidation and corrosion on the ladder and staining on the adjacent liner.



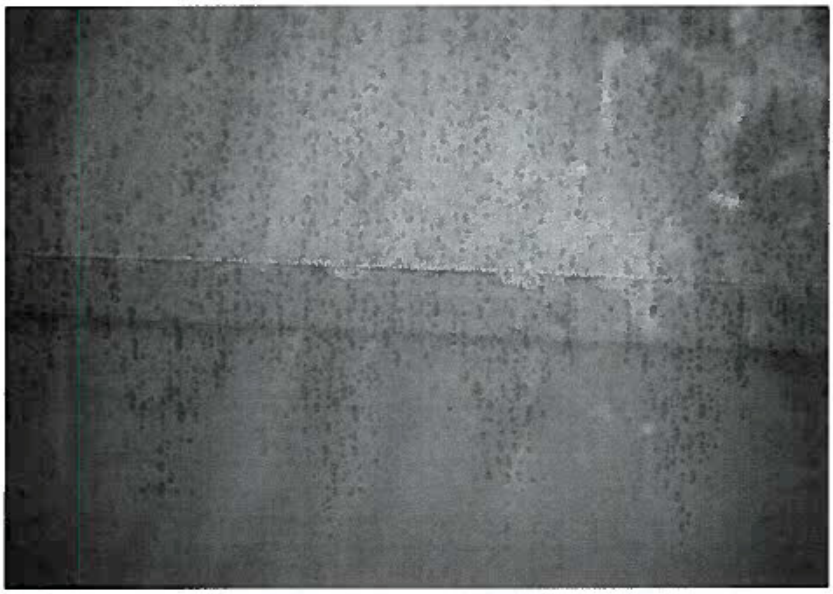
I-22 View of the bottom of the ladder, illustrating moderate corrosion on the ladder and debris on the liner below the ladder. Note liner appears to be blistered and loose near the bottom penetration.

I-23 View of a ladder stand-off bracket, illustrating moderate corrosion on the ladder, bracket, and nuts and bolts.

I-24 View of the liner at seams, illustrating a white residue on the vertical seam.



I-25 Same as Photo I-24, except in a different location. Note heavier residue material on a portion of the vertical seam.



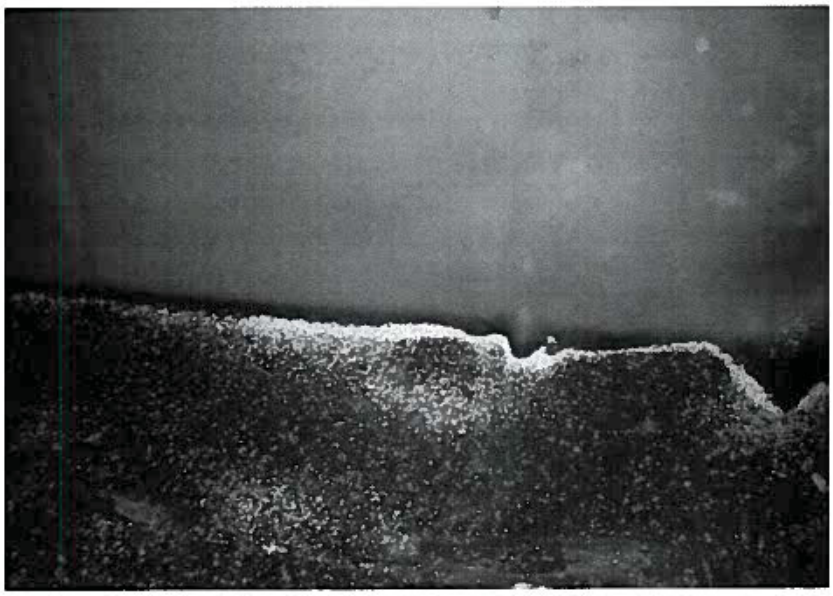
I-26 Close-up view of the liner, illustrating apparent deterioration of the liner material along the upper portion of the seam.

I-27 View of a wall to floor transition, illustrating loose liner and light debris on the floor.

I-28 Same as Photo I-27, except in a corner of the reservoir.

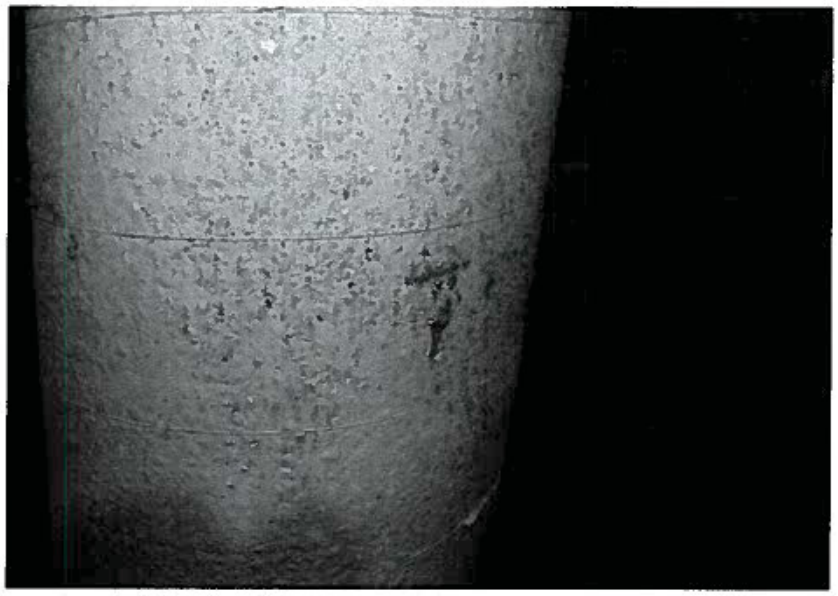
I-29 Same as Photos I-27 and I-28, except in a different location.

I-30 Same as Photos I-27 through I-29, except in a different location.

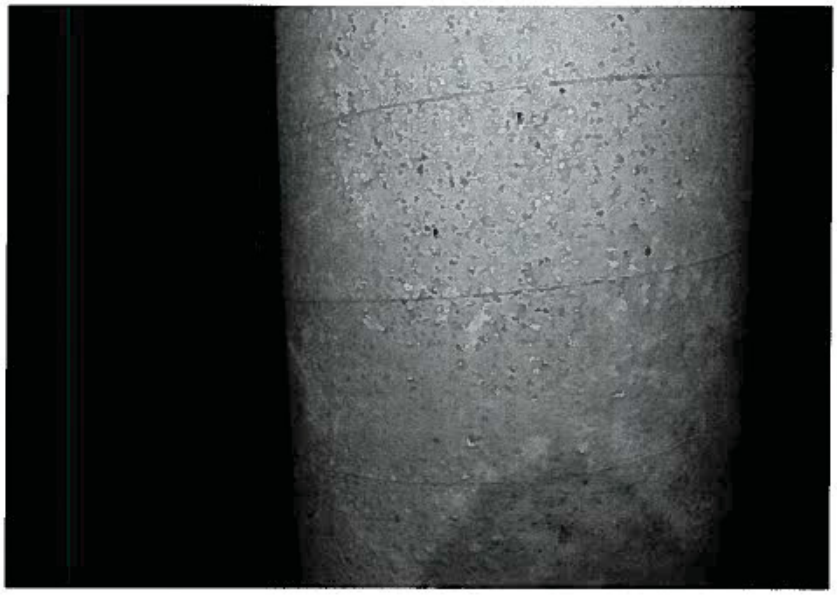


I-31 Same as Photos I-27 through I-30, except in a different location. Note a patch appears to be in good condition.

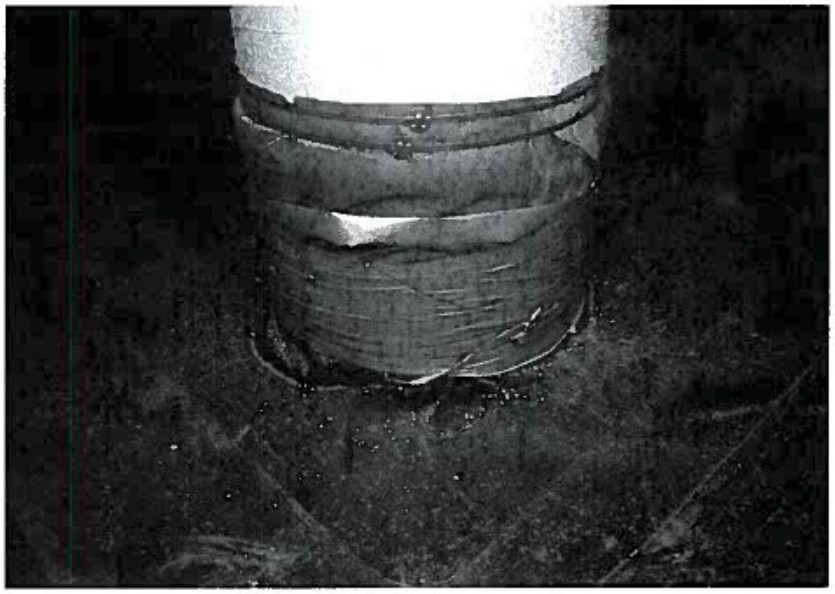
I-32 View of a column below the waterline, illustrating severe blistering of the coating system and minor spots of corrosion.



I-33 Same as Photo I-32, except at a different column.



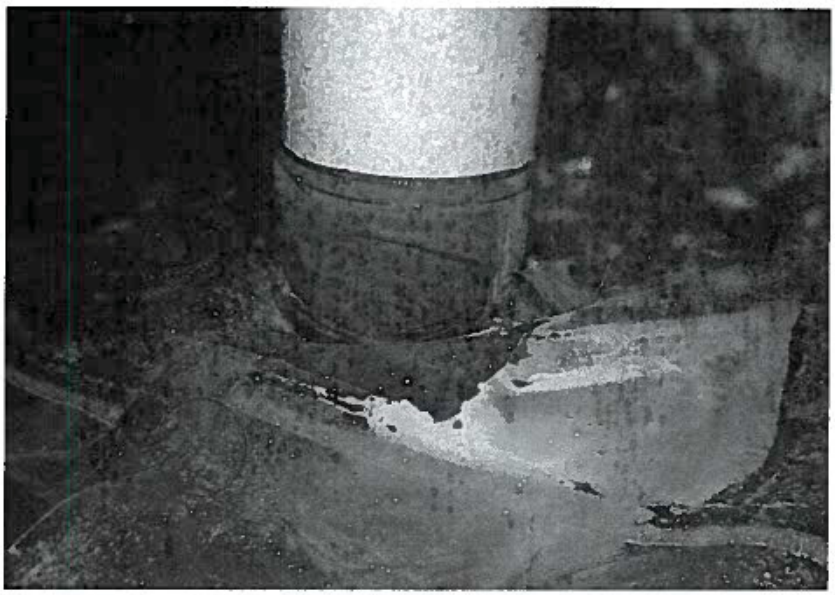
I-34 Same as Photos I-32 and I-33, except at the lower portion of a column.



I-35 View of a column to liner transition, illustrating duct tape wrapped around the column, spots of corrosion, and the overall poor condition of the transition. Note liner on the floor to the left of the column appears to be cracked.

I-36 Same as Photo I-35, except at a different column.

I-37 Same as Photos I-35 and I-36, except at a different column. Note liner is lifted or bubbled up around the column.



I-38 Same as Photo I-37, except from a different angle. Note areas where seams do not appear to be tight.

I-39 View of the liner between columns, illustrating a large portion of the liner has lifted off the floor. (The distance between columns is approximately 15 ft.) Note random patches on the liner.

I-40 Same as Photo I-39, except from a different angle.

I-41 Same as Photos I-39 and I-40, except in a different location.

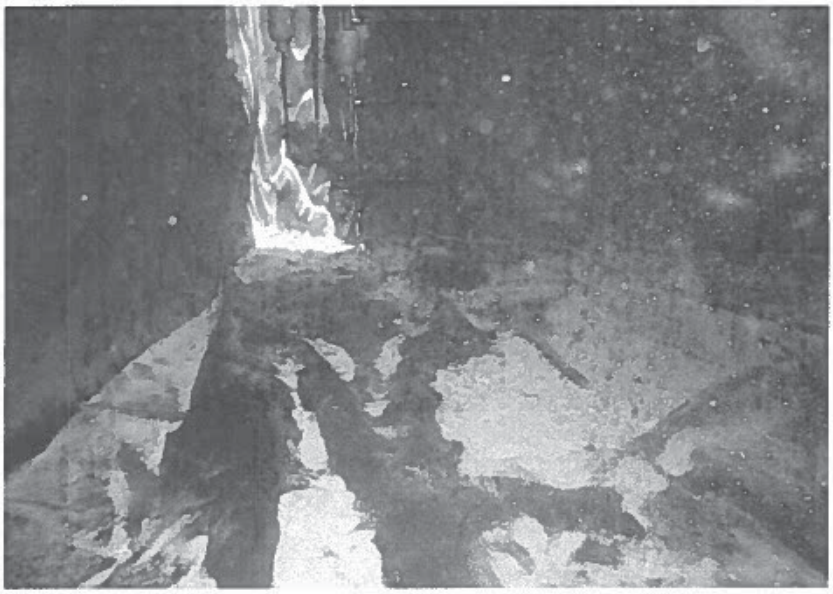
I-42 View of a portion of the liner on the floor, illustrating a long fold in the liner and debris on the adjacent surfaces.

I-43 Close-up view of a patch on the lifted liner, illustrating poor condition of the patch. Note material used to secure the patch does not cover the lower left corner of the patch.

I-44 View of another patch on the liner, illustrating generally good condition of the patch. Note wrinkles going through the right side of the patch.

I-45 Close-up view of the liner, illustrating blisters in the liner material.

I-46 Close-up view of the liner, illustrating corroding debris on the liner.



I-47 View of the liner near the ladder and inlet/outlet, illustrating sediment and debris on the liner.

I-48 View of the inlet/outlet pipe, illustrating minor corrosion at the upper circumference of the pipe and heavy debris on the adjacent surfaces. Note delaminating patch on the adjacent liner.

ATTACHMENT T

CORONA ENVIRONMENTAL CONSULTING

Golden State Water Company:
Southwest Water System
Southern 06 Wellsite Improvements

Basis of Design Report
August 20, 2019

Prepared by Corona Environmental Consulting, LLC

CORONA ENVIRONMENTAL CONSULTING

Table of Contents

List of Figures

List of Tables

CORONA ENVIRONMENTAL CONSULTING

Introduction and Background

Golden State Water Company's (GSWC) Southwest System is supplied by a blend of treated surface water from the Metropolitan Water District of Southern California (MWD) and groundwater produced from a series of wells. Water quality problems have occurred in the Southwest System such as nitrification and colored water events, which have been attributed to the use of the groundwater wells.

The Southern 06 Well is located at the Southern Wellsite and is treated at the Southern Treatment Plant. There are a variety of known contaminants in this well, including ammonia, iron and manganese. Additionally, since the water quality of the Southwest System and the MWD are dissimilar with respect to their dissolved oxygen (DO) concentrations, the mixing of these waters in the distribution system is believed to contribute to the observed water quality issues. Thus, increasing DO levels during the groundwater treatment process may stabilize water quality in the distribution system.

GSWC engaged Corona Environmental Consulting, LLC (Corona) to (i) evaluate water quality and existing treatment processes at 7 Southwest System Wellsites and (ii) develop process recommendations and identify operational changes that would address water quality challenges. Through previous phases of this project, which included a review of water quality data, an evaluation of existing treatment processes, and an assessment of operational data (Phase I), as well as bench-scale testing (Phase II), treatment alternatives were identified that could satisfy regulations and GSWC water quality goals.

In Phase III, treatment alternative analyses and basis of design reports were developed for the Goldmedal and Doty Wellsites. Phase III was expanded to include the 129th St., Ballona, Belhaven, Dalton, and Southern Wellsites. On May 22nd, 2019, Corona led a web-based treatment alternatives analysis workshop with GSWC staff for these additional wellsites. The content presented and decisions made during the workshop are summarized in a technical memorandum entitled "Alternatives Analysis Workshop Summary," which informs the basis of design at the Southern Treatment Plant presented in this report.

Based on the three phases of work and the existing infrastructure at the Southern Treatment Plant, the proposed treatment train is as follows:

Site Overview

The Southern Wellsite, shown in Figure 1, is located at 13505 S. Vermont Ave. Gardena, CA 90247. The Wellsite contains two treatment plants, the Southern West Plant and the Southern Treatment Plant, which are responsible for treating water from the Southern 05 and Southern 06 wells, respectively. The well pump diagram and details for the Southern 06 Well, which produces water at a rate of 1,000 gpm, are provided in Appendix A.

Figure 1. Southern Wellsite with the Southern 06 Well's Southern WTP outlined in red

Between January 2009 and June 2018, Southern 06 was utilized on average at 68% (Table 1). It should be noted that between most of June 2015 and June 2018, the well was offline.

Table 1. Southern 06 Well capacity and average production

Parameter	January 2009 - June 2018
Capacity (gpm)	1000
Average annual production (MG)	356
Utilization (%)	68

Water Quality

A summary of the relevant water quality parameters collected in 2018 from the Southern 06 Well's raw and finished water locations are presented in Table 2. A summary of the historical data collected between 2009 and 2018 is also provided.

Table 2. Water quality parameters collected from the Southern 06 Well's raw and finished water locations between August and October 2018. Averages of historical data were collected between 2009 and 2018.

Analyte	Southern 06					
	Raw			Finished		
	Range	Average or Result	Historical average or result	Range	Average or Result	Historical average or result
Color (CU)	ND-5	ND	1	-	ND	-
DO (mg/L)	0.18-0.35	0.25	-	-	-	-
Total Ammonia (mg-N/L)	0.23-0.24	0.23	-	0.54-0.64	0.59	-
Total Chlorine (mg-Cl_2/L)	-	-	-	2.37-3.20	2.89	3.33
Total Iron (mg/L)	0.230-0.280	0.245	0.08	-	ND	-
Total Manganese (mg/L)	0.038-0.042	0.041	0.044	-	ND	ND
TOC (mg/L)	0.41-3.90	1.34	0.53	0.37-0.48	0.43	-

A key item to note from Table 2 is the ammonia concentrations observed in the well's raw water. The presence of ammonia could result in incomplete breakpoint chlorination through the filters. This was observed in the August-October 2018 sampling program, where ammonia concentrations in the filter effluent were as high as 0.1 mg-N/L. Iron and manganese levels in the raw water do not satisfy the GSWC internal water goals presented in Table 3; however, they do achieve the goals following treatment. DO concentrations in the raw and finished water do not satisfy the GSWC goal.

Table 3. GSWC treated water quality goals.

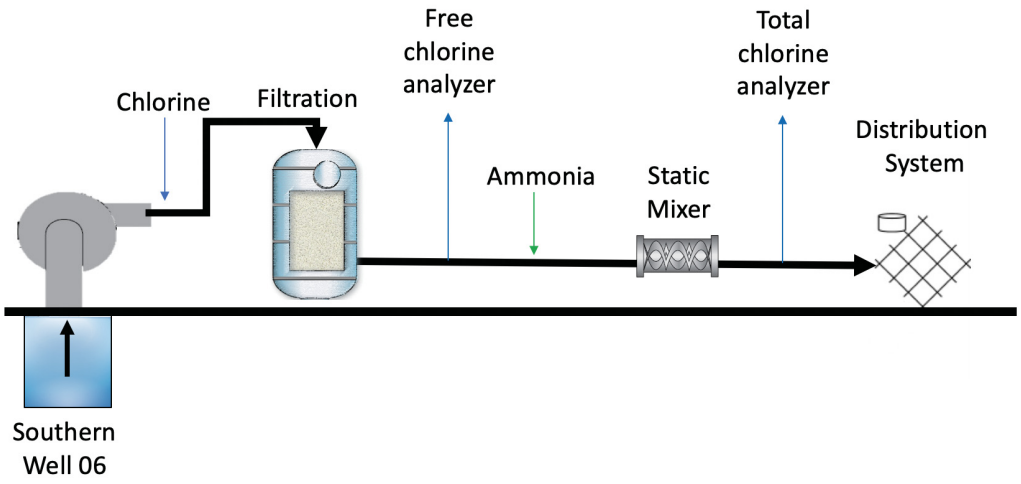
Parameter	SMCL or MCL	Point of Entry to Distribution System Goal	Distribution System Goal
Color (CU)	15	< 5	-
Odor (TON)	3	<2	-
DO (mg/L)	None	8-10	-
Total ammonia (mg-N/L)[1]	None	Non-detect prior to ammonia addition, then present to have a Cl:NH_3 ratio of 4.7:1 to 5:1	-
Free ammonia (mg-N/L)[2]	None	Non-detect (<0.05)	<0.05
Iron (mg/L)[3]	0.3	Non-detect (<0.02)	-
Manganese (mg/L)[4]	0.05	Non-detect (<0.002)	-
Methane (mg/L)[5]	<10	<10	<10
Free chlorine residual (mg/L)	4	2-3.5 before chloramination	-
Total chlorine residual (mg/L)	4	2-3.5 after chloramination	>1.5
Chlorine to ammonia ratio	None	Cl:NH_3 ratio with a target of 4.7:1 to 5:1 after ammonia addition	3 -5
TTHM (µg/L)	80	-	<64
HAA5 (µg/L)	60	-	<48

[1]The HACH SL-1000 detection limit for total ammonia is 0.05 mg-N/L, [2]The HACH SL-1000 detection limit for free ammonia is 0.05 mg-N/L, [3]The California detection limit for purposes of reporting (DLR) for iron is 0.1 mg/L, [4]The DLR for manganese is 0.02 mg/L, [5]In the initial phases of this project, methane goal and suggested limit were considered to be <1 mg/L. Discussion with DDW resulted in clarification that a goal of 1 mg/L for methane would not be enforced, hence the recommended limit and the goal was set to <10 mg/L, which is considered to be the potential explosive limit.

Existing Treatment Processes

The existing treatment process at the Southern Plant, illustrated by the process flow diagram in Figure 2. Existing process flow diagram. includes chlorine addition, filtration, and chloramine formation.

Figure 2. Existing process flow diagram.



The Southern 06 Well, shown in the existing site layout in Figure 3, is located just east of the center of the Southern Wellsite. Raw water piped from the Southern 06 Well is injected with liquid sodium hypochlorite to oxidize iron and manganese, as well as to regenerate the MnO_2-containing media in the downstream pressure filter. The vertical pressure filters then removes the oxidized iron and manganese. Free chlorine concentrations are measured in the filter effluent, which is then injected with liquid ammonium hydroxide to form monochloramine. Finished water is piped north, where it enters the distribution system. The diameter of the distribution system pipe is 12 inches.

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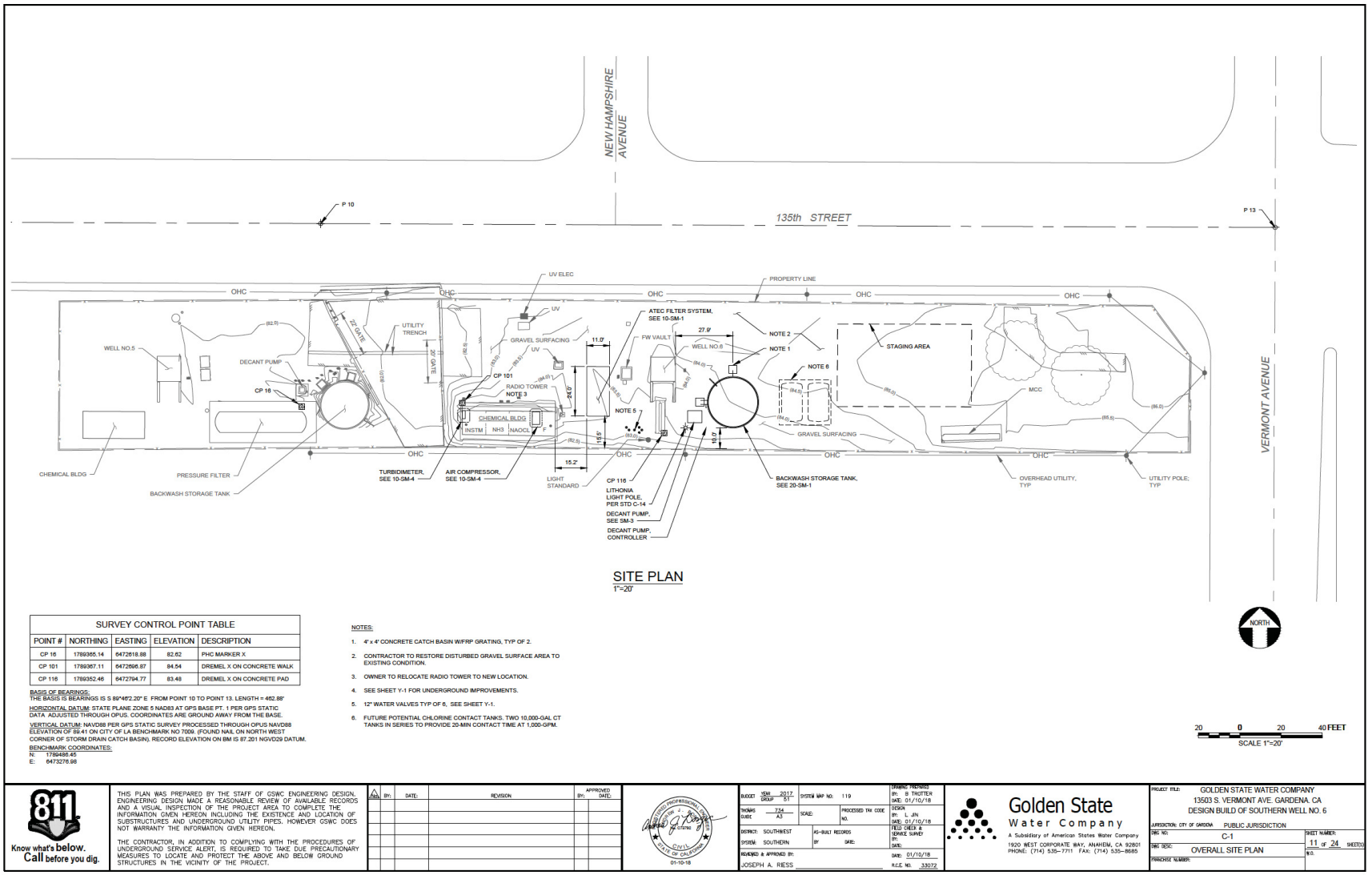
Figure 3. Southern 06 Wellsite layout (2018)



SITE PLAN
1"=20'

SURVEY CONTROL POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP 16	1789365.14	6472618.88	82.62	PHC MARKER X
CP 101	1789367.11	6472696.87	84.54	DREMEL X ON CONCRETE WALK
CP 116	1789352.46	6472794.77	83.48	DREMEL X ON CONCRETE PAD

BASIS OF BEARINGS:
THE BASIS IS BEARINGS IS S 89°46'2.20" E FROM POINT 10 TO POINT 13. LENGTH = 462.88'

HORIZONTAL DATUM: STATE PLANE ZONE 5 NAD83 AT GPS BASE PT. 1 PER GPS STATIC DATA ADJUSTED THROUGH OPUS. COORDINATES ARE GROUND AWAY FROM THE BASE.

VERTICAL DATUM: NAVD88 PER GPS STATIC SURVEY PROCESSED THROUGH OPUS NAVD88 ELEVATION OF 89.41 ON CITY OF LA BENCHMARK NO 7009. (FOUND NAIL ON NORTH WEST CORNER OF STORM DRAIN CATCH BASIN); RECORD ELEVATION ON BM IS 87.201 NGVD29 DATUM.

BENCHMARK COORDINATES:
N: 1789486.45
E: 6473276.98

NOTES:

1. 4' x 4' CONCRETE CATCH BASIN W/FRP GRATING, TYP OF 2.
2. CONTRACTOR TO RESTORE DISTURBED GRAVEL SURFACE AREA TO EXISTING CONDITION.
3. OWNER TO RELOCATE RADIO TOWER TO NEW LOCATION.
4. SEE SHEET Y-1 FOR UNDERGROUND IMPROVEMENTS.
5. 12" WATER VALVES TYP OF 6, SEE SHEET Y-1.
6. FUTURE POTENTIAL CHLORINE CONTACT TANKS. TWO 10,000-GAL CT TANKS IN SERIES TO PROVIDE 20-MIN CONTACT TIME AT 1,000-GPM.

811 Know what's below. Call before you dig.

THIS PLAN WAS PREPARED BY THE STAFF OF GSWC ENGINEERING DESIGN. ENGINEERING DESIGN MADE A REASONABLE REVIEW OF AVAILABLE RECORDS AND A VISUAL INSPECTION OF THE PROJECT AREA TO COMPLETE THE INFORMATION GIVEN HEREON INCLUDING THE EXISTENCE AND LOCATION OF SUBSTRUCTURES AND UNDERGROUND UTILITY PIPES. HOWEVER GSWC DOES NOT WARRANTY THE INFORMATION GIVEN HEREON.

THE CONTRACTOR, IN ADDITION TO COMPLYING WITH THE PROCEDURES OF UNDERGROUND SERVICE ALERT, IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO LOCATE AND PROTECT THE ABOVE AND BELOW GROUND STRUCTURES IN THE VICINITY OF THE PROJECT.

MARK	BY:	DATE:	REVISION	APPROVED BY:	DATE:

CIVIL — STATE OF CALIFORNIA — 01-10-18

BUDGET YEAR 2017 GROUP 51 | SYSTEM MAP NO: 119 | DRAWING PREPARED BY: B TROTTER DATE: 01/10/18
THOMAS GUIDE 734 A3 | SCALE: | PROCESSED TM CODE NO. | DESIGN BY: L JIN DATE: 01/10/18
DISTRICT: SOUTHWEST | AS-BUILT RECORDS | FIELD CHECK & SERVICE SURVEY BY:
SYSTEM: SOUTHERN | BY | DATE: | DATE:
REVIEWED & APPROVED BY: JOSEPH A. RESS | DATE: 01/10/18 | R.C.E. NO. 53072

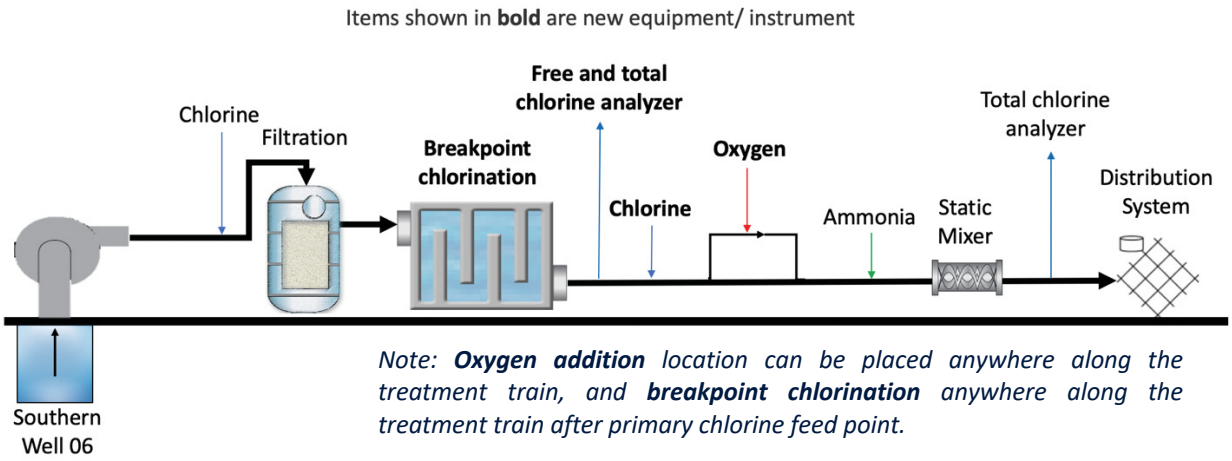
Golden State Water Company
A Subsidiary of American States Water Company
1920 WEST CORPORATE WAY, ANAHEIM, CA 92801
PHONE: (714) 535-7711 FAX: (714) 535-8685

PROJECT TITLE: GOLDEN STATE WATER COMPANY
13503 S. VERMONT AVE. GARDENA, CA
DESIGN BUILD OF SOUTHERN WELL NO. 6
JURISDICTION: CITY OF GARDENA PUBLIC JURISDICTION
DRG NO: C-1 SHEET NUMBER: 11 of 24 SHEET(S)
DRG DESC: OVERALL SITE PLAN W.O.
FRANCHISE NUMBER:

Recommended Treatment Processes

The recommended treatment process at the Southern Treatment Plant is chlorine addition, filtration, breakpoint chlorination, DO augmentation and chloramine formation, as shown in Figure 4.

Figure 4. Proposed process flow diagram, where new processes are provided in bold.

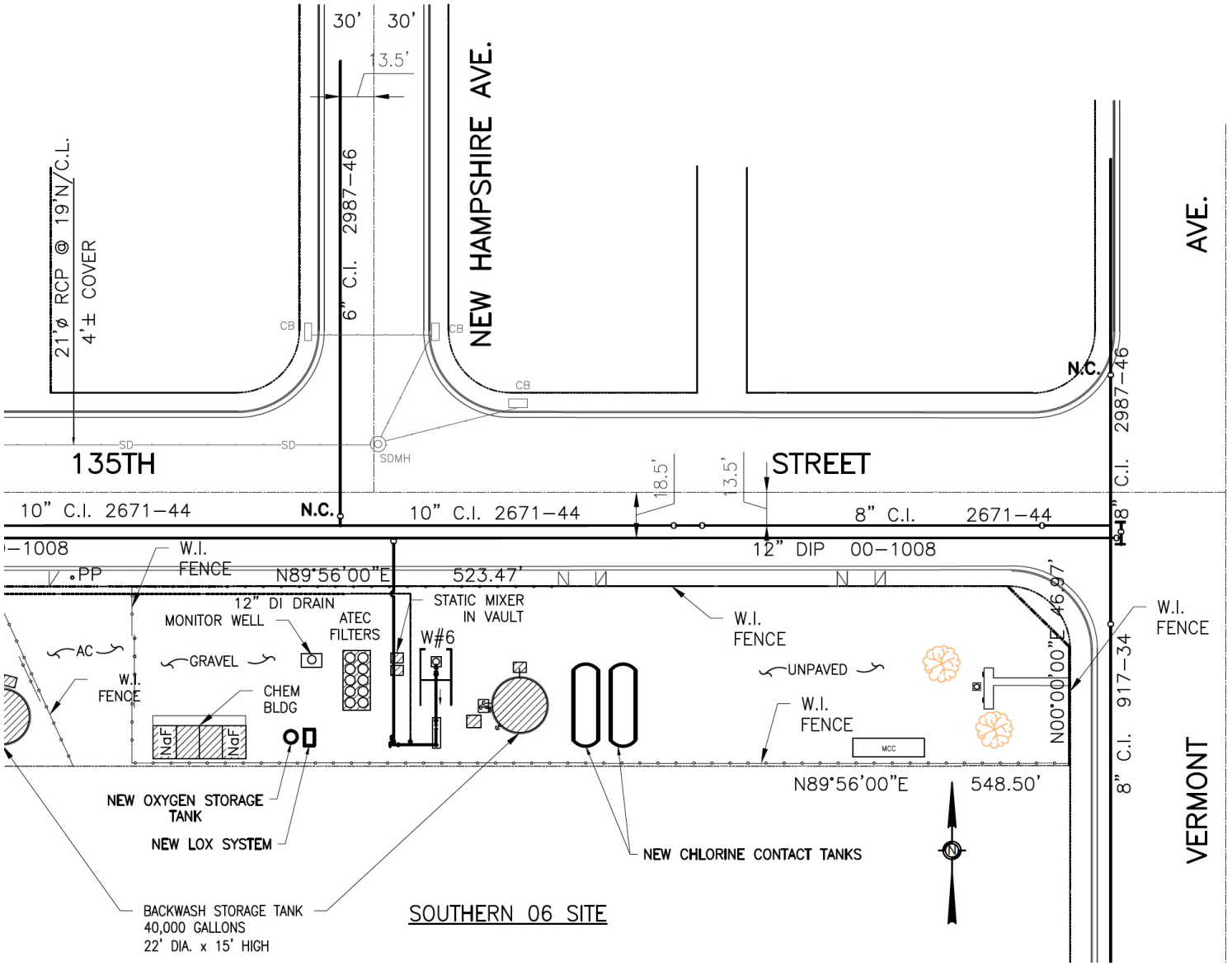


Iron and manganese will continue to be removed by the existing filtration process. The new chlorine reaction vessels should ideally be installed downstream of the filters to avoid manganese accumulation in the reaction vessels which would be a maintenance concern. However, at the Southern 06 Wellsite blind flanges and a tee have been installed upstream of the filters for future connection to reaction vessels. Hence it may be more cost effective to install the reaction vessels upstream of the filters. During the design phase, the engineer should verify location of existing tee and blind flanges upstream of the filters, and confirm the location of the reaction vessels and oxygen addition in the treatment train.

Chlorine will regenerate the MnO_2-containing filter media and will oxidize the ammonia through the breakpoint chlorination process. DO augmentation in the treatment train will be achieved by adding liquid oxygen to satisfy the internal water quality goal. Following the new free and total chlorine analyzer, a new chlorine metering pump will trim the chlorine prior to the addition of ammonia for monochloramine formation. Chloraminated water will flow through the existing static mixer and total chlorine concentrations will be measured in the finished water prior to it entering the distribution system.

A conceptual site layout, showing a potential location for the liquid oxygen system and the chlorine reaction vessels east of the Southern 06 Well, is provided in Appendix B. An image of this layout is shown in Figure 5. The purpose of this site layout is to show how the equipment could fit on the Wellsite. It is possible during the design phase that the locations will change. A conceptual site layout with potential piping alignment is shown in Appendix E.

Figure 5. Conceptual Southern Treatment Plant site layout (Not for construction).



Recommended Improvements

DO Augmentation

Dissolved oxygen will be augmented at the Southern 06 Wellsite to achieve a DO concentration between 8 and 10 mg/L. DO will be increased without breaking head, designed based on the functionality of a BlueInGreen SDOX-125® system that dissolves liquid oxygen into a pressurized sidestream of process water to achieve a supersaturated DO solution. The concentrated sidestream of DO can be injected upstream of the breakpoint chlorination vessels; however, this location can be relocated to any other location along the treatment train, if desired. The SDOX® system is skid-mounted and includes a pump, VFD, pressure vessel, mixing apparatus, piping, and all instrumentation and controls. The VFD allows the feed rate to be adjusted between 0 to 100% of its capacity. Details for this system are summarized in Table 4.

Table 4. Liquid oxygen system details.

Vendor	BlueInGreen
Model	SDOX-125®
Oxygen Feed	Liquid oxygen
Maximum Oxygen Consumption (@1100 gpm; lbs/day)	132
VFD Pump size (HP)	2.5-3.5
Electrical requirements	480V, 3 PH, 60 Hz
Material	Stainless Steel
LOX generation/injection system dimensions	L=6.5 ft, W= 4 ft, H=6.75 ft
LOX storage tank volume (L)	2,707
Storage tank dimensions	D=4.92 ft, H=9.74 ft
Side stream (inlet/outlet) pipe diameter (in)	1.25
Controls	PLC

Liquid oxygen that will be used to make the concentrated sidestream will be supplied by Airgas. Liquid oxygen will be stored in a 3,000 L storage tank that will be leased from Airgas.

Breakpoint Chlorination

Breakpoint chlorination vessels will be designed based on the functionality of the Highland Tank baffled pressure vessels that have baffling factors of 0.7. These reaction vessels will supplement the contact time provided by the filtration system, to achieve an effective contact time of no less than 20 minutes between the chlorine and ammonia feed points, using the sum of the well's design capacity of 1,000 gpm and the reclaim water flowrate of 100 gpm. In this scenario, the effective contact time is defined as the mean residence time multiplied by the baffling factor. The volume of the pressurized vessels, based on the specifications of the current filtration system, was calculated to be 27,000 gallons using the equation presented in Appendix C.

It should be noted that the volume of the breakpoint chlorination tanks could be reduced by taking into account the contact time within the pipes; however, since the current site layouts are conceptual, the

additional contact time afforded by the pipelines have not been included in the volume calculation. Additional size saving will be provided by installing the breakpoint chlorination vessels before the filters. This would allow for the volume of the vessels to be calculated using a maximum flow rate of 1,000 gpm, without having to account for the 100 gpm of reclaim water. However , for this configuration, manganese accumulation within the tank would have to be considered.

Chemical Addition and Analyzers

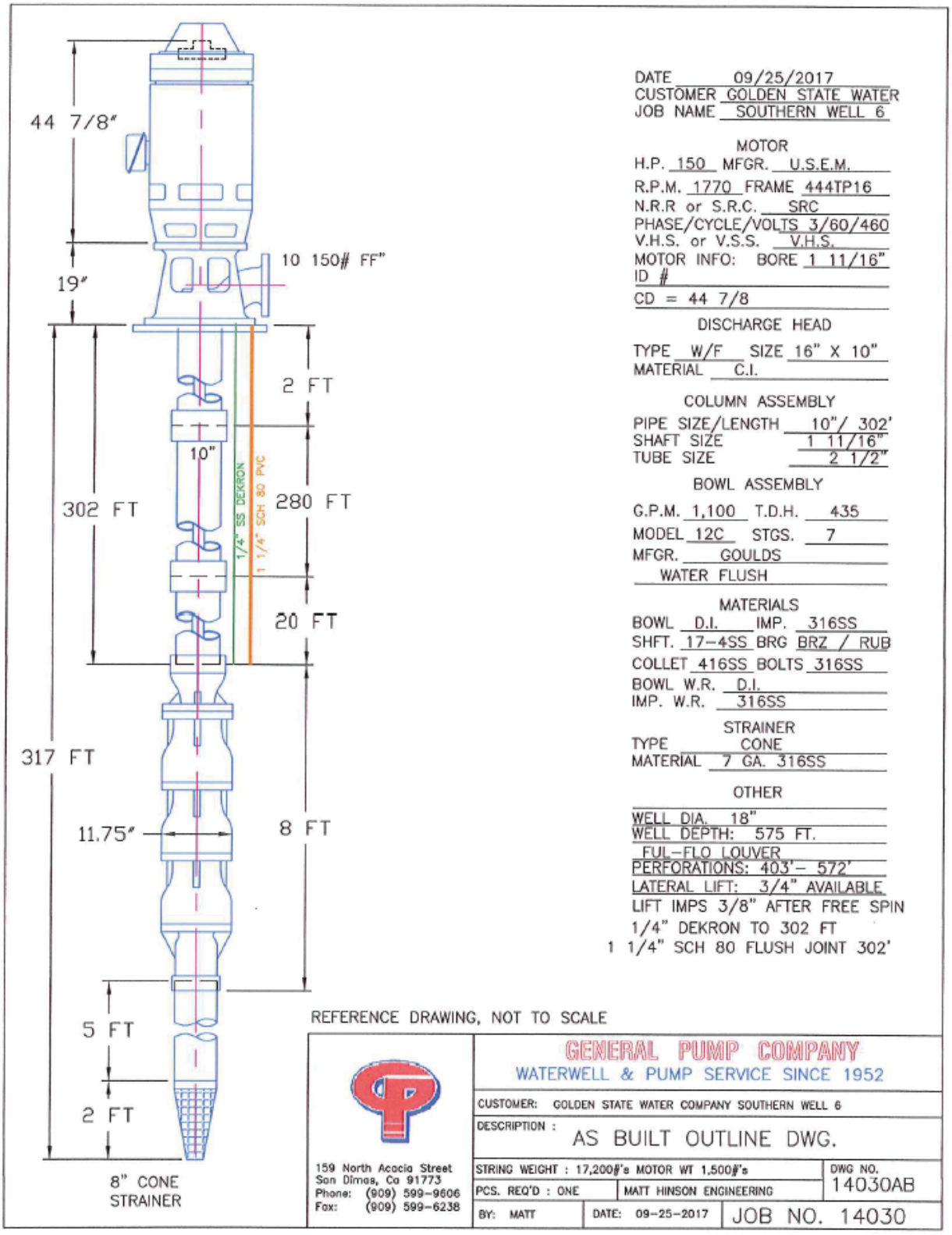
The existing chemical metering pump, specified to dose 12.5% sodium hypochlorite at a maximum of 2.90 gph, will dose chlorine upstream of the filtration system. A new chlorine metering pump, with a capacity of 2.99 gph, will add chlorine downstream of the free and total chlorine analyzer and upstream of the ammonium hydroxide feed. The additional chlorine injection point will enable chlorine to be adjusted to the desired level, in the event that chlorine demand fluctuates across the filter. The existing fluoride addition system will continue to be used, with no modifications required. The existing chemical metering pump, specified to dose 19.9% ammonium hydroxide at a maximum flowrate of 0.95 gph, will continue to dose ammonia downstream of the secondary chlorine addition point and upstream of the static mixer. Chemical details are provided in Appendix D.

The existing total chlorine analyzer will be moved downstream of the ammonia addition point and static mixer and will used to measure total chlorine levels prior to the finished water entering the distribution system. A free and total chlorine analyzer will be installed downstream of the breakpoint chlorination vessels to monitor fluctuation of chlorine demand across the filter and breakpoint chlorination vessels and allow for additional chlorine dosing prior to the addition of ammonia, as required. This analyzer will improve process monitoring and control capabilities. Table 5 shows the chemical storage and feed requirements after the recommended improvements are implemented at the Southern 06 Wellsite. During the design phase, the design engineer should verify with GSWC staff if the chemical refill frequencies are feasible, if they are not then chemical storage should be increased either by upgrading the storage tank or adding another bay for chemical storage.

Table 5. Chemical storage and feed requirements.

Design Flow	1,000 gpm
Sodium Hypochlorite (12.5%) Storage Capacity	500 gallons
Aqua Ammonia (19.9%) Storage Capacity	240 gallons
Sodium Hypochlorite Feed Pump Capacity	2.99 gph
Aqua Ammonia Feed Pump Capacity	0.95 gph
New Sodium Hypochlorite Feed Pump Capacity	2.99 gph
Recommended Chlorine Dose	6.8 mg/L
Recommended Ammonia Dose	0.7 mg-N/L
Daily Sodium Hypochlorite Consumption	65.3 gal/day
Daily Aqua Ammonia Consumption	5.9 gal/day
Sodium Hypochlorite Refill Frequency	8 days
Aqua Ammonia Refill Frequency	41 days

Appendix A — Southern 06 Well Pump Diagram and Details



DATE 09/25/2017
CUSTOMER GOLDEN STATE WATER
JOB NAME SOUTHERN WELL 6

MOTOR
H.P. 150 MFGR. U.S.E.M.
R.P.M. 1770 FRAME 444TP16
N.R.R or S.R.C. SRC
PHASE/CYCLE/VOLTS 3/60/460
V.H.S. or V.S.S. V.H.S.
MOTOR INFO: BORE 1 11/16"
ID #
CD = 44 7/8

DISCHARGE HEAD
TYPE W/F SIZE 16" X 10"
MATERIAL C.I.

COLUMN ASSEMBLY
PIPE SIZE/LENGTH 10"/ 302'
SHAFT SIZE 1 11/16"
TUBE SIZE 2 1/2"

BOWL ASSEMBLY
G.P.M. 1,100 T.D.H. 435
MODEL 12C STGS. 7
MFGR. GOULDS
WATER FLUSH

MATERIALS
BOWL D.I. IMP. 316SS
SHFT. 17-4SS BRG BRZ / RUB
COLLET 416SS BOLTS 316SS
BOWL W.R. D.I.
IMP. W.R. 316SS

STRAINER
TYPE CONE
MATERIAL 7 GA. 316SS

OTHER
WELL DIA. 18"
WELL DEPTH: 575 FT.
FUL-FLO LOUVER
PERFORATIONS: 403'- 572'
LATERAL LIFT: 3/4" AVAILABLE
LIFT IMPS 3/8" AFTER FREE SPIN
1/4" DEKRON TO 302 FT
1 1/4" SCH 80 FLUSH JOINT 302'

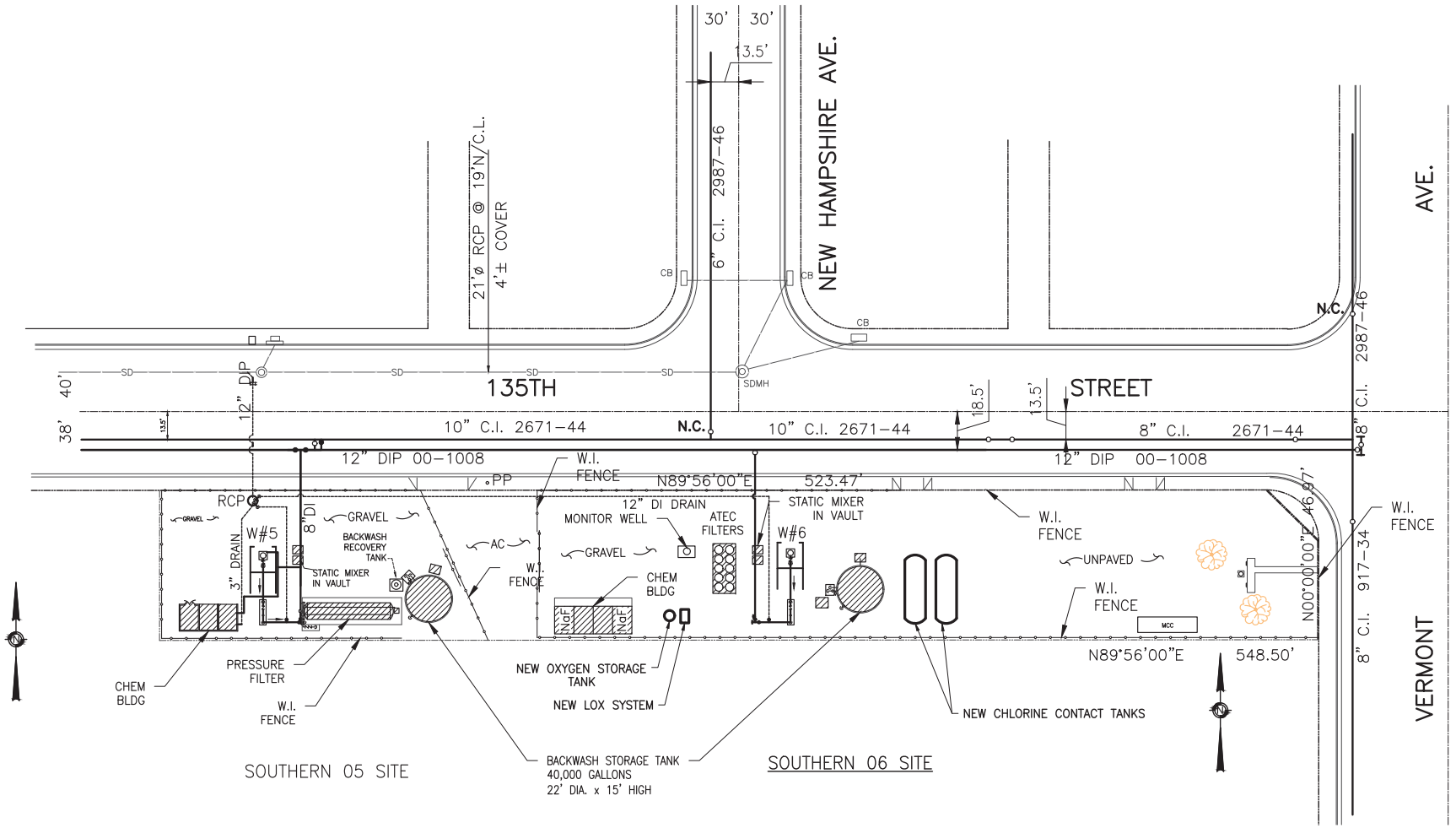
REFERENCE DRAWING, NOT TO SCALE

159 North Acacia Street
San Dimas, Ca 91773
Phone: (909) 599-9606
Fax: (909) 599-6238

GENERAL PUMP COMPANY
WATERWELL & PUMP SERVICE SINCE 1952

CUSTOMER: GOLDEN STATE WATER COMPANY SOUTHERN WELL 6
DESCRIPTION : AS BUILT OUTLINE DWG.
STRING WEIGHT : 17,200#'s MOTOR WT 1,500#'s | DWG NO. 14030AB
PCS. REQ'D : ONE | MATT HINSON ENGINEERING
BY: MATT | DATE: 09-25-2017 | JOB NO. 14030

Appendix B — Site Layout Drawing



CONCEPTUAL SOUTHERN-06 SITE LAYOUT (NOT FOR CONSTRUCTION)

SCALE: 1"=50'

0 50' 100'

CORONA ENVIRONMENTAL CONSULTING

GOLDEN STATE WATER COMPANY
SOUTHERN-06 WELL IMPROVEMENTS
GARDENA, CA
JULY 2019

Appendix C — Baffled pressurized vessel volume calculation

BF_f = Baffling factor of filter = 0.7

BF_v = Baffling factor of baffled, pressurized vessel = 0.7

V_f = Total empty bed volume of filtration vessels= 4700 gallons

V_v = Minimum volume of baffled, pressurized vessel(s)

Q = Design capacity = 1,100 gpm

T_{10} = effective contact time = 20 min

$$V_v = \frac{Q\left(T_{10} - BF_f\left(\frac{V_f}{Q}\right)\right)}{BF_v}$$

Appendix D — Chemical Stock Details

MULTI-CHLOR

Safety Data Sheet

12.5% Sodium Hypochlorite

Emergency 24 Hour Telephone: **CHEMTREC 800.424.9300**

Corporate Headquarters: Hasa Inc.
P.O. Box 802736
Santa Clarita, CA 91355
Telephone • 661.259.5848
Fax • 661.259.1538

SECTION 1: IDENTIFICATION			
1.1	**Product Identification:**		
	1.1.1	**Product Name:**	MULTI-CHLOR
	1.1.2	**CAS #** (Chemical Abstracts Service)**:**	7681-52-9
	1.1.3	**RTECS** (Registry of Toxic Effects of Chemical Substances)**:**	NH3486300
	1.1.4	**EINECS** (European Inventory of Existing Commercial Substances)**:**	231-668-3
	1.1.5	**EC Number:**	231-668-3
	1.1.6	**Synonym:**	Bleach, Hypo, Hypochlorite, Liquid Chlorine Solution
	1.1.7	**Chemical Name:**	Sodium Hypochlorite
	1.1.8	**Chemical Formula:**	NaOCl
1.2	**Recommended Uses:**		Sanitizer of swimming pool and spa water.
1.3	**Company Identification:**		Hasa Inc. P. O. Box 802736 Santa Clarita, CA 91355
1.4	**Emergency Telephone Number:**		**CHEMTREC** 1-800-424-9300 (24 hour Emergency Telephone)
1.5	**Non-Emergency Assistance:**		661-259-5848 (8 AM – 5 PM PST / PDT)

SAFETY DATA SHEET

Aqua Ammonia (5-19.9%)

Airgas
an Air Liquide company

Section 1. Identification

GHS product identifier : Aqua Ammonia (5-19.9%)

Other means of identification : Aqua Ammonia, Ammonium Hydroxide

Product type : Liquid.

Product use : Synthetic/Analytical chemistry.

Synonym : Aqua Ammonia, Ammonium Hydroxide

SDS # : 001196

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN CORROSION - Category 1B
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
AQUATIC HAZARD (ACUTE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : May displace oxygen and cause rapid suffocation.
Causes severe skin burns and eye damage.
May cause respiratory irritation.
Very toxic to aquatic life.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.

Response : Collect spillage. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 2. Hazards identification

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Aqua Ammonia, Ammonium Hydroxide

Product code : 001196

Ingredient name	%	CAS number
Aqua Ammonia	100	1336-21-6
WATER	80.1 - 95	7732-18-5
ammonia	5 - 19.9	7664-41-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : May cause respiratory irritation.

Skin contact : Causes severe burns.

SAFETY DATA SHEET

SODIUM FLUORIDE Coarse

Revision Date 11/05/2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name SODIUM FLUORIDE Coarse

1.2 Relevant identified uses of the substance or mixture and uses advised against

Uses of the Substance / Mixture

- Welding and soldering agents
- Metallurgy.
- Glass industry
- Dental application
- Water treatment

1.3 Details of the supplier of the safety data sheet

Company

SOLVAY FLUORIDES, LLC
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: +1-800-7658292; +1-713-5256700
Fax: +1-713-5257805

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture

HCS 2012 (29 CFR 1910.1200)

Acute toxicity, Category 3 H301: Toxic if swallowed.

2.2 Label elements

HCS 2012 (29 CFR 1910.1200)

Pictogram

Signal Word

- Danger

Hazard Statements

- H301 Toxic if swallowed.

Precautionary Statements

Prevention

- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.

Response

- P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.

Storage

- P405 Store locked up.

Disposal

- P501 Dispose of contents/ container to an approved waste disposal plant.

Additional Labeling

- The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 100 %

2.3 Other hazards which do not result in classification

- Toxic if swallowed.
- Irritating to eyes and skin.
- Hazardous decomposition products formed under fire conditions.
- Contact with acids liberates very toxic gas.

SECTION 3: Composition/information on ingredients

3.1 Substance

Hazardous Ingredients and Impurities

Chemical Name	Identification number CAS-No.	Concentration [%]
sodium fluoride	7681-49-4	>= 99

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

3.2 Mixture

Not applicable, this product is a substance.

SECTION 4: First aid measures

4.1 Description of first-aid measures

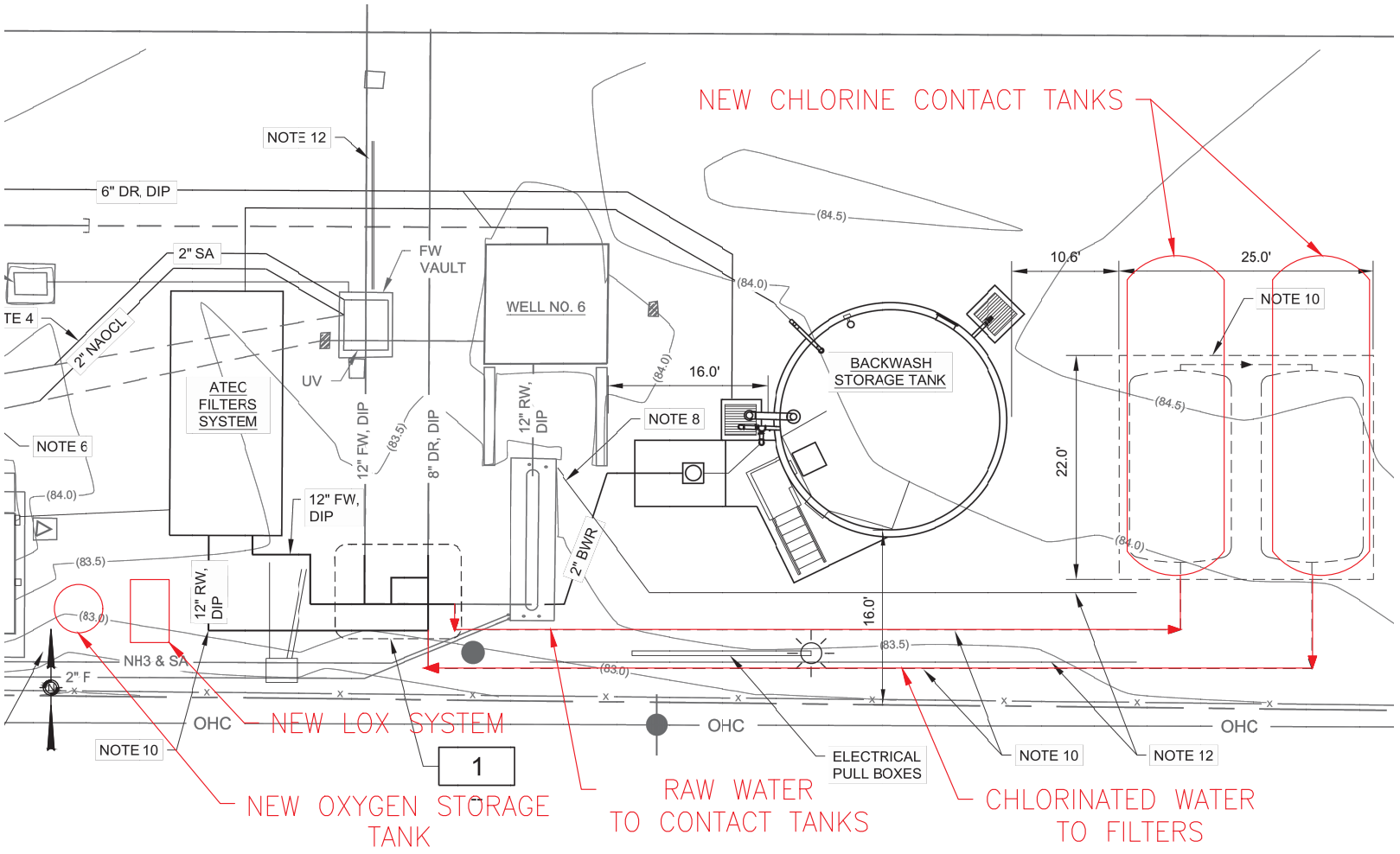
In case of inhalation

- Remove the subject from dusty environment and let him blow his nose.
- Oxygen or artificial respiration if needed.
- If symptoms persist, call a physician.

In case of skin contact

- Take off contaminated clothing and wash before reuse.
- Wash off immediately with soap and plenty of water.
- If symptoms persist, call a physician.

Appendix E —Site Piping Drawing



CONCEPTUAL SOUTHERN–06 SITE PIPING (NOT FOR CONSTRUCTION)

SCALE: NTS

GOLDEN STATE WATER COMPANY
SOUTHERN–06 WELL IMPROVEMENTS
GARDENA, CA
AUGUST 2019

CORONA ENVIRONMENTAL CONSULTING

CORONA ENVIRONMENTAL CONSULTING

Golden State Water Company:
Southwest Water System Wellsite Improvements

Basis of Design Report
Revised August 22, 2019

Prepared by Corona Environmental Consulting, LLC

CORONA ENVIRONMENTAL CONSULTING

Table of Contents

List of Figures

List of Tables

1.0 Introduction and Background

Golden State Water Company's (GSWC) Southwest System is supplied by a blend of treated surface water from the Metropolitan Water District of Southern California (MWD) and groundwater produced from a series of wells. Water quality problems have occurred in the Southwest System such as nitrification and colored water events, which have been attributed to the use of the groundwater wells.

The Southwest System's wells contain a variety of known contaminants, such as ammonia, total organic carbon, manganese and iron. To address these contaminants, GSWC have set internal water quality goals for their systems, as presented in Table 1.1. Additionally, since the water quality of the Southwest System groundwater and the MWD are dissimilar with respect to their dissolved oxygen (DO) concentrations, mixing these waters in the distribution system is believed to contribute to the observed water quality issues. Thus, increasing DO levels during the groundwater treatment process may stabilize water quality in the distribution system.

Table 1.1. GSWC treated water quality goals.

Parameter	SMCL or MCL	Point of Entry Goal	Distribution System Goal
Color (CU)	15	< 5	-
Odor (TON)	3	<2	-
DO (mg/L)	None	8-10	-
Total ammonia (mg-N/L)[1]	None	Non-detect prior to ammonia addition, then present to have a Cl:NH_3 ratio of 4.7:1 to 5:1	-
Free ammonia (mg-N/L)[2]	None	Non-detect (<0.05)	<0.05
Iron (mg/L)[3]	0.3	Non-detect (<0.02)	-
Manganese (mg/L)[4]	0.05	Non-detect (<0.002)	-
Methane (mg/L)[5]	<10	<10	<10
Free chlorine residual (mg/L)	4	2-3.5 before chloramination	-
Total chlorine residual (mg/L)	4	2-3.5 after chloramination	>1.5
Chlorine to ammonia ratio[6]	None	Cl:NH_3 ratio with a target of 4.7:1 to 5:1 after ammonia addition	4.7:1 to 5:1
TTHM (µg/L)	80	-	<64
HAA5 (µg/L)	60	-	<48

[1]The HACH SL-1000 detection limit for total ammonia is 0.05 mg-N/L, [2]The HACH SL-1000 detection limit for free ammonia is 0.05 mg-N/L, [3]The California detection limit for purposes of reporting (DLR) for iron is 0.1 mg/L, [4]The DLR for manganese is 0.02 mg/L, [5]In the initial phases of this project the methane goal was considered to be <1 mg/L. Discussion with DDW resulted in clarification that a goal of 1 mg/L for methane would not be enforced, hence the recommended limit and the goal was set to <10 mg/L, which is considered to be the potential explosive limit, [6]Chlorine to ammonia ratio could be affected in the distribution system by other factors, if it drops below 4.7:1 then it needs to be fixed in the distribution system by cleaning and/or chloramine boosting.

GSWC engaged Corona Environmental Consulting, LLC (Corona) to (i) evaluate water quality and existing treatment processes at 7 Southwest System wellsites and (ii) develop process recommendations and identify operational changes that would address water quality challenges. Through previous phases of this project, which included a review of water quality data, an evaluation of existing treatment processes, and

an assessment of operational data (Phase I) as well as bench-scale testing (Phase II), treatment alternatives were identified that could satisfy regulations and GSWC water quality goals.

In Phase III, treatment alternative analyses and basis of design reports were developed for the Goldmedal and Doty Wellsites. Phase III was expanded to include the 129th St., Ballona, Belhaven, Dalton, and Southern Wellsites. On May 22nd, 2019, Corona led a web-based treatment alternatives analysis workshop with GSWC staff for these additional wellsites. The content presented and decisions made during the workshop are summarized in a brief technical memorandum entitled "Alternatives Analysis Workshop Summary", which informs the basis of design at the 129th St., Belhaven and Southern West Plant Wellsites presented in Sections 2, 3 and 4, respectively, in this report.

2.0 129th St. Wellsite

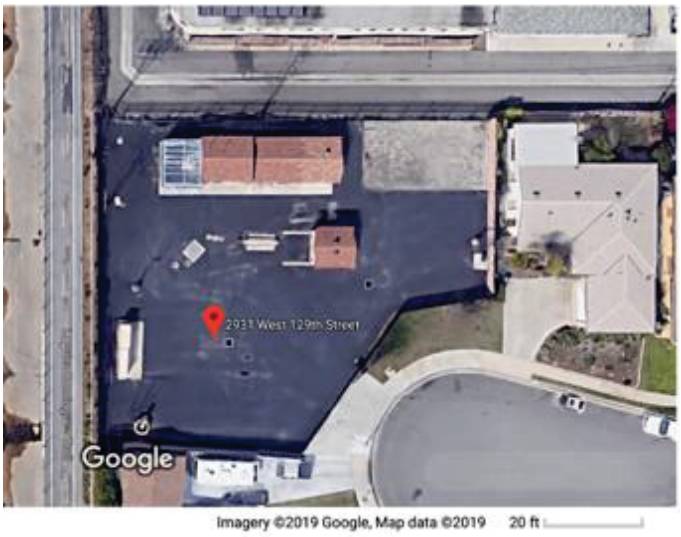
The 129th St. Wellsite contains one well, 129th St. 02. There are several contaminants in this well such as ammonia, color, manganese, and TOC that are regulated and/or cause treatment problems. Additional water quality issues could be caused by the mixing of the well's groundwater and the MWD surface water which have dissimilar DO concentrations. Thus, increasing DO levels in 129th St. 02 well's groundwater may stabilize water quality in the distribution system.

Based on the three phases of work described in Section 1.0, the proposed treatment train at the 129th St. Wellsite is as follows:

2.1. Site Overview

The 129th St. Wellsite, shown in Figure 2.1, is located at 2931 W. 129th St. Gardena, CA 90249, and contains the 129th St. Well 02 that produces water at a rate of 1,250 gpm. The pump curve for this well is provided in Appendix A.

Figure 2.1. 129th St. Wellsite.



Since June 2015, the 129th St. 02 well has been offline due to the water quality challenges described below. Between January 2014 and June 2015, it was utilized on average at 85% (Table 2.1).

Table 2.1. 129th St. 02 well capacity and average production

Parameter	January 2014- June 2015	July 2015-June 2019
Capacity (gpm)	1,250	1,250
Average annual production (MG)	557	0
Utilization (%)	85	0

2.2. Water Quality

A summary of relevant water quality parameters collected in 2018 from the raw and finished water locations is shown in Table 2.2.

Table 2.2. Water quality parameters collected from 129th St Well 02 raw and finished water between August and October 2018. Averages of historical data were collected between 2010 and 2015.

Analyte	129th St. Well 02					
	Raw			Finished		
	Range	Average or Result	Historical average or result	Range	Average or Result	Historical average or result
Color (CU)	10-20	13	10	ND-15	9	-
DO (mg/L)	0.11-0.18	0.15	-	0.07-0.38	0.17	-
Total Ammonia (mg-N/L)	0.73-0.78	0.756	-	0.64-0.74	0.708	-
Total Chlorine (mg-Cl_2/L)	-	-		3.4-3.6	3.5	3.9
Total Iron (mg/L)	0.092-0.12	0.110	0.04	0.024-0.058	0.035	-
Total Manganese (mg/L)	0.031-0.038	0.034	0.037	0.026-0.033	0.028	-
TOC (mg/L)	0.99-1.00	1.00	1.1	-	1.0	-

A key item to note from Table 2.2. is the high ammonia concentrations in the raw and finished water. Since chloramines were formed using naturally occurring ammonia, high levels of chlorine were required. These concentrations approached the maximum residual disinfectant level, explaining the finished water historical average of 3.9 mg/L. In addition, color levels have exceeded the secondary maximum contaminant level in the raw and finished water. Likewise, iron, manganese, and DO levels in the raw and finished water do not satisfy GSWC internal water quality goals presented in Table 1.1. Although raw water iron and manganese levels are less than their respective SMCLs, during previous phases of this project it was decided that iron and manganese should be treated to below detection limits to inhibit iron and manganese accumulation and release in the distribution system.

2.3. Existing Treatment Process

The existing treatment process at the 129th St. Wellsite consists of chloramine formation by adding chlorine to combine with the naturally occurring ammonia, as shown in Figure 2.2. The 129th St. 02 Well is located slightly north-east of the center of the 129th St Wellsite as shown in Figure 2.3.

Figure 2.2. Existing 129th St. process flow diagram.

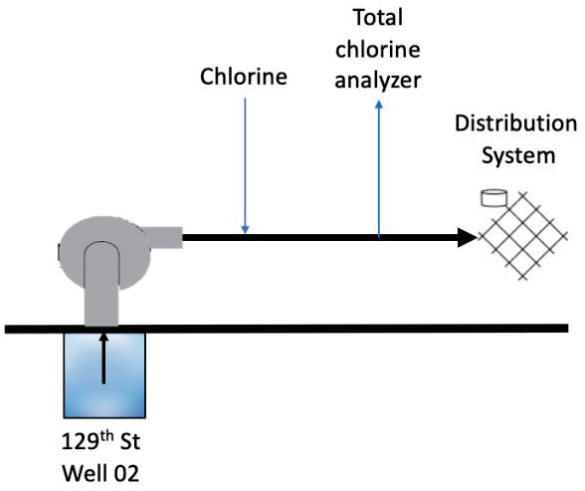
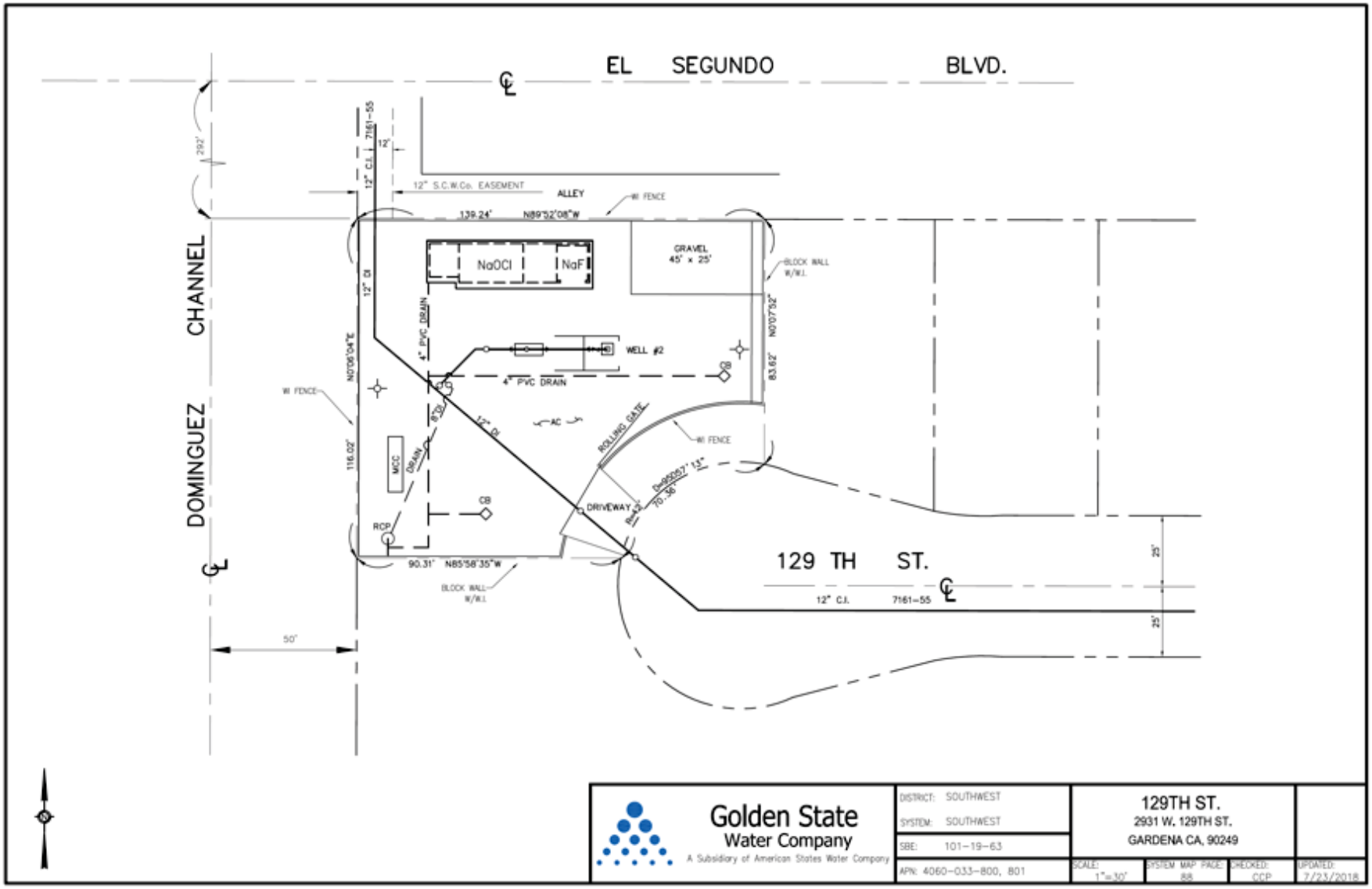


Figure 2.3. 129th St. Wellsite layout (2018).

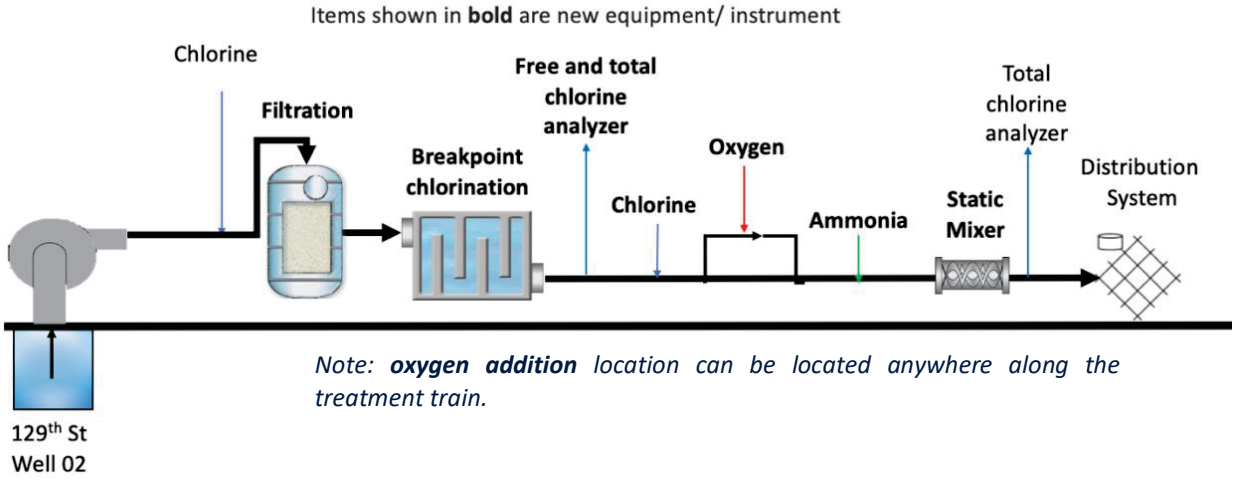


Liquid sodium hypochlorite chlorine is injected immediately downstream of the well. Following the injection of chlorine, the total chlorine concentration is monitored with a total chlorine monitor. chloraminated water enters the distribution system through an underground distribution system pipe. The pipe runs diagonally across the site, which is slightly south-west of the center of the wellsite. The diameter of the distribution system pipe is 12 inches. A 45-foot by 25-foot section of the Wellsite, located in the northeast corner, is empty gravel. The chemical storage and instrumentation building that has an open bay available for ammonium hydroxide storage is located to the west.

2.4. Recommended Treatment Processes

The recommended treatment process is chlorine addition, filtration, breakpoint chlorination, DO augmentation and chloramine formation as shown in Figure 2.4.

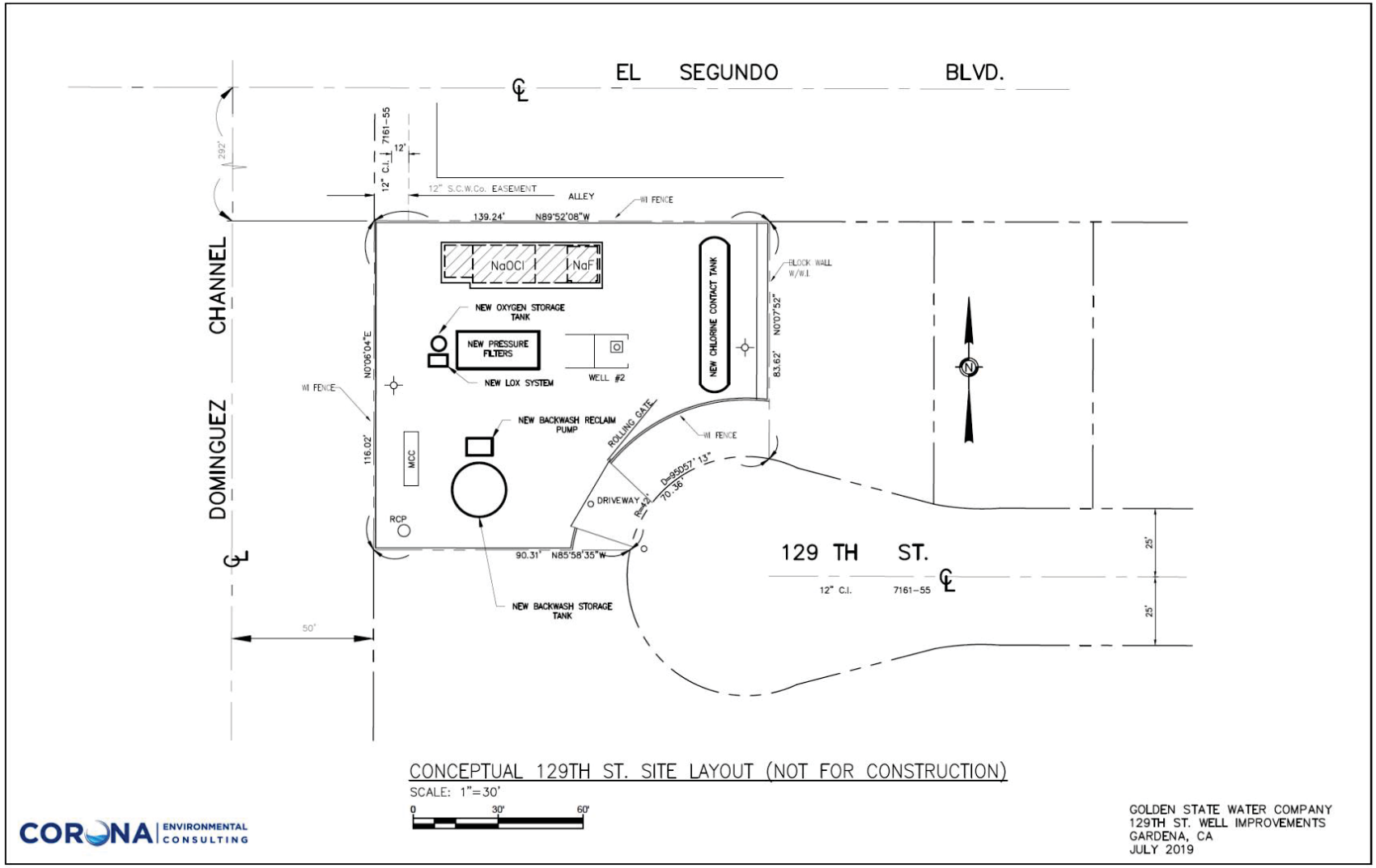
Figure 2.4. Proposed 129th St. process flow diagram where new processes are provided in bold.



Iron and manganese will be removed by filtration with pyrolusite-based media that will be regenerated by chlorine. Chlorine will also oxidize the ammonia through the breakpoint chlorination process, where color is expected to be reduced. DO will be augmented by adding liquid oxygen to satisfy the water quality goal. Since the raw water ammonia has historically been used to form chloramines, ammonia will now be dosed in a controlled manner to form chloramines with a new ammonia feed system. Following the addition of ammonia, a static mixer will be installed, and total chlorine concentrations will be measured downstream.

A conceptual site layout showing potential locations for the new equipment is provided in Appendix B, and an image of this layout is shown in Figure 2.5. The purpose of this site layout is to show how equipment could fit on the Wellsite. Considerable changes to this site layout may occur during the design phase. Note that the volume of the breakpoint chlorination vessel may change (<10% change) depending on the dimensions of the filtration system selected. It is anticipated that filtration equipment and the backwash tank will utilize a smaller footprint than what is designated for this equipment in Figure 2.5

Figure 2.5. Conceptual 129th St. site layout (Not for construction).



2.5. Recommended Improvements

2.5.1. DO Augmentation

DO will be augmented at the 129th St. Wellsite to achieve a DO concentration between 8 and 10 mg/L. DO will be increased without breaking head, designed based on the functionality of a BlueInGreen SDOX-125® system that dissolves liquid oxygen into a pressurized sidestream of process water to achieve a supersaturated DO solution. The concentrated sidestream of DO can be injected downstream of the second chlorine injection location and upstream of the ammonia addition. However, this location can be relocated to any other location along the treatment train, as desired. The SDOX® system is skid-mounted and includes a pump, VFD, pressure vessel, mixing apparatus, piping, and all instrumentation and controls. Details for this system are summarized in Table 2.3.

Table 2.3. Liquid oxygen system details.

Vendor	BlueInGreen
Model	SDOX-125®
Oxygen Feed	Liquid oxygen
Maximum Oxygen Consumption (lbs/day)	144
VFD Pump size (HP)	2.5-3.5
Electrical requirements	480V, 3 PH, 60 Hz
Material	Stainless Steel
LOX generation/injection system dimensions	L=6.5 ft, W= 4 ft, H=6.75 ft
LOX storage tank volume (L)	2,707
Storage tank dimensions	D=4.92 ft, H=9.74 ft
Side stream (inlet/outlet) pipe diameter (in)	1.25
Controls	PLC

Liquid oxygen that will be used to make the concentrated sidestream will be supplied by Airgas. Liquid oxygen will be stored in a 3,000 L storage tank that will be leased from Airgas.

2.5.2. Filtration

Filtration systems shall satisfy the following requirements:

- Vessels can be either horizontally or vertically configured
- System must be capable of producing treated water iron concentrations consistently less than 0.02 mg/L
- System must be capable of producing treated water manganese concentrations less than 0.002 mg/L
- Media — pyrolusite based
- Hydraulic loading rate — provide at least three examples where a system using the proposed media has been successfully permitted in California at or above the proposed hydraulic loading rate, where the primary purpose was manganese removal. The proposed hydraulic loading rate shall be calculated assuming one vessel/cell is out of service for backwash and account for the additional flow of reclaim water from the backwash tank.

- Filtration system footprint — TBD by design engineer
- Backwash supply must be provided from process water without additional provisions for onsite storage
- Maximum clean-bed headloss of 10 psi and a maximum headloss of 20 psi prior to backwash, across the entire treatment system

The backwash reclamation system shall satisfy the following requirements:

- Maximum backwash storage tank height — Height: 16 ft
- Backwash tank volume — vendor shall supply calculations validating that the backwash tank is appropriately sized such that the filtration system can operate continuously using the proposed backwash hydraulic loading rate and backwash duration.
- Backwash reclaim pump — Design flow rate: 125 gpm @ a discharge pressure of 105 psi

2.5.3. Breakpoint Chlorination

Breakpoint chlorination vessels will be designed based on the functionality of the Highland Tank baffled pressure vessels that have baffling factors of 0.7. These reaction vessels shall supplement the contact time provided by the filtration system to achieve an effective contact time of no less than 20 minutes between chlorine and ammonia feed points using the sum of the design capacity of 1,250 gpm and the reclaim water return flowrate of 125 gpm. Effective contact time is defined here as the mean residence time multiplied by the appropriate baffling factor. A 0.7 baffling factor shall also be applied to filtration vessels. The volume of the pressurized vessel(s) shall be calculated using the equation in Appendix C once a filtration system has been selected and specifications are known.

2.5.4. Chemical Addition and Analyzers

A chemical metering pump, specified for dosing 12.5% sodium hypochlorite at a maximum flow of 8.0 gph, shall be used to dose chlorine upstream of the filtration system. The existing chlorine metering pump that has a capacity of 2.99 gph shall add chlorine downstream of the free and total chlorine analyzer, and upstream of the ammonium hydroxide feed location. A new chemical metering pump specified for dosing 19.9% ammonium hydroxide at a maximum flow of 1.2 gph shall be used to dose ammonia downstream of the secondary chlorine addition point and upstream of a new static mixer.

The existing total chlorine analyzer will be moved downstream of the ammonia addition location and used to measure total chlorine levels prior to finished water entering the distribution system. An additional chlorine feed location and free and total chlorine analyzer will be installed downstream of the breakpoint chlorination vessels. The additional chlorine injection point will enable chlorine to be adjusted to the desired level exiting wellsite in the event that the chlorine demand across the filter and breakpoint vessels fluctuates. Both total chlorine and free chlorine will be measured downstream of the filtration vessel and upstream of the ammonia addition point to improve process monitoring and control capabilities. Chemical details are provided in Appendix F. Table 2.4 shows the chemical storage and feed requirements after the recommended improvements are implemented at the 129th St. Wellsite.

Table 2.4. Chemical storage and feed requirements.

Design Flow	1,250 gpm
Sodium Hypochlorite Storage Capacity	500 gallons
Ammonium Hydroxide Storage Capacity	TBD by Design Engineer
Sodium Hypochlorite Feed Pump Capacity	2.99 gph
New Ammonium Hydroxide Feed Pump Capacity	1.6 gph
New Sodium Hypochlorite Feed Pump Capacity	7.7 gph
Recommended Chlorine Dose	10.3 mg/L
Recommended Ammonia Dose	0.64 mg-N/L
Daily Sodium Hypochlorite Consumption[1]	125 – 193 gal/day
Daily Ammonium Hydroxide Consumption[2]	8 – 32 gal/day
Sodium Hypochlorite Refill Frequency[1]	2.6 – 4 days
Ammonium Hydroxide Refill Frequency	TBD by Design Engineer

[1]Assumes 12.5% hypochlorite stock decays up to 8%, [2]Assumes ammonium hydroxide stock concentrations as high as 19.9%. and as low as 5% (see Appendix F).

During the design phase, the design engineer should verify with GSWC staff if the chemical refill frequency for sodium hypochlorite is feasible, if it is not then chemical storage should be increased either by upgrading the storage tank or adding another bay for chemical storage. For ammonium hydroxide, existing 129th St. extra bay should be used, and the size of the tanks should be determined by the design engineer after considering the available bay space and the chemical refill frequency preferred by GSWC operations staff.

3.0 Belhaven Wellsite

The Belhaven Wellsite contains two wells, Belhaven 03 and Belhaven 04. There are regulated contaminants in the Belhaven Wells' raw water including manganese and iron. Additional water quality issues could be caused by the mixing of the wells' groundwater and the MWD surface water which have dissimilar DO concentrations. Thus, increasing DO levels in the Belhaven 03 and 04's groundwater may stabilize water quality in the distribution system.

Based on the three phases of work described in Section 1.0, the proposed treatment train at the Belhaven Wellsite is as follows:

3.1. Site Overview

The Belhaven Wellsite, shown in Figure 3.1, is located at 11230 S. Belhaven St. Los Angeles, CA 90059. The Wellsite contains Belhaven Well 03 and Belhaven Well 04, which produce water at rates of 950 and 1200 gpm, respectively. Well pump diagrams and details are provided in Appendix D.

Figure 3.1. Belhaven Wellsite.

Between January 2014 and July 2018, the Belhaven 03 and 04 Wells were utilized on average at 64% and 63%, respectively (Table 3.1. Belhaven 03 and 04 well capacities, average production, and utilization between January 2014 and July 2018.). It should be noted that between most of February 2015 and

February 2016 the wells were offline due to colored water in the distribution system that was believed to have been caused by operating the GSWC groundwater wells.

Table 3.1. Belhaven 03 and 04 well capacities, average production, and utilization between January 2014 and July 2018.

Parameter	Belhaven 03	Belhaven 04
Capacity (gpm)	950	1200
Average annual production (MG)	318	397
Utilization (%)	64	63

3.2. Water Quality

A summary of relevant water quality parameters collected in 2018 from the raw and finished water locations at Belhaven 03 and Belhaven 04 are shown in Table 3.2 and Table 3.3, respectively. A summary of the historical data collected between 2010 and 2018 is also provided.

Table 3.2. Water quality parameters collected from Belhaven Well 03 raw and finished water between August and October 2018. Averages of historical data were collected between 2010 and 2018.

Analyte	Belhaven Well 03					
	Raw			Finished		
	Range	Average or Result	Historical average or result	Range	Average or Result	Historical average or result
Color (CU)	-	ND	-	-	ND	-
DO (mg/L)	0.12-0.32	0.21	-	0.21-0.39	0.32	-
Total Ammonia (mg-N/L)	-	ND	-	0.65-0.74	0.69	-
Total Chlorine (mg-Cl_2/L)	-	-	-	2.92-3.37	3.14	3.03
Total Iron (mg/L)	0.028-0.030	0.029	0.010	-	ND	-
Total Manganese (mg/L)	0.025-0.026	0.026	0.024	0.012-0.014	0.013	-

Table 3.3. Water quality parameters collected from Belhaven Well 04 raw and finished water between August and October 2018. Averages of historical data were collected between 2010 and 2015.

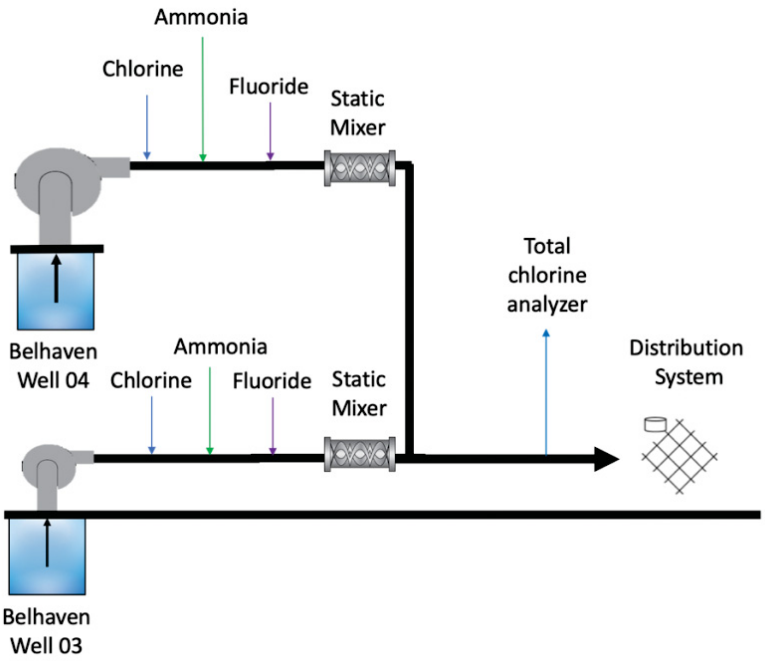
Analyte	Belhaven Well 04					
	Raw			Finished		
	Range	Average or Result	Historical average or result	Range	Average or Result	Historical average or result
Color (CU)	-	ND	ND	-	ND	-
DO (mg/L)	0.17-0.29	0.23	-	0.21-0.38	0.31	-
Total Ammonia (mg-N/L)	0.06-0.07	0.06	-	0.63-0.95	0.77	-
Total Chlorine (mg-Cl_2/L)	-	-	-	2.80-3.43	3.00	3.22
Total Iron (mg/L)	0.080-0.090	0.080	0.070	ND-0.033	0.008	-
Total Manganese (mg/L)	0.032-0.035	0.034	0.032	0.015-0.021	0.018	-

Key items to note from Table 3.2 and Table 3.3 are the low ammonia concentrations (≤0.1 mg-N/L), which as defined in previous phases of the project, negates the need for the breakpoint chlorination recommended to treat several other Southwest wells. Furthermore, color levels have been near or below the detection limit and the benefit of using breakpoint chlorination to decrease color associated with organics is irrelevant. Total chlorine concentrations in the finished water have also been acceptable. Both iron and manganese levels exceed GSWC internal water quality goals presented in Table 1.1. While the raw and finished water iron and manganese concentrations are less than their regulated limits, it was decided during previous phases of this project that iron and manganese should be treated to below detection limits to inhibit iron and manganese accumulation and release in the distribution system. Total iron and manganese concentrations (i.e., the sum of dissolved and particulate concentrations) decreased between the raw and finished water for both Belhaven 03 and 04. These results are unexpected as the only treatment at both wells was chlorine addition, followed by ammonia addition to form chloramines. Iron and manganese filtration systems should be designed, assuming the existing system does not partially remove iron and manganese. Lastly, DO levels in the raw and finished water do not satisfy the water quality goal as specified in Table 1.1.

3.3. Existing Treatment Processes

The existing treatment process at the Belhaven Wellsite consists of chlorine addition, followed by ammonia addition to form chloramines. Chloraminated Belhaven 03 and Belhaven 04 water is then combined prior to entering the distribution system as shown in Figure 3.2.

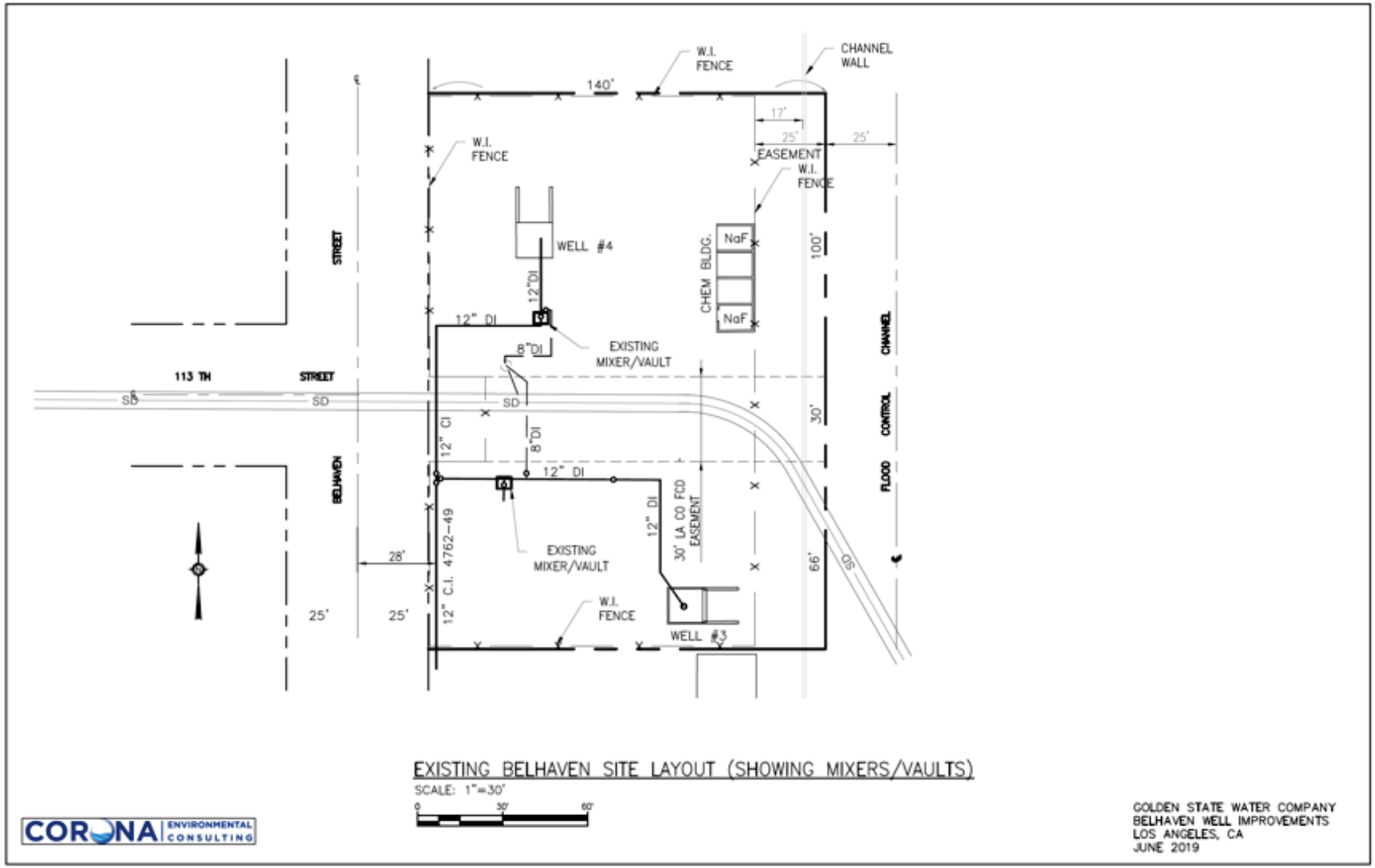
Figure 3.2. Existing Belhaven process flow diagram.



Immediately downstream of each well, liquid sodium hypochlorite chlorine is injected, followed by liquid ammonium hydroxide. The water is then mixed through a static mixer. Total chlorine concentrations are monitored following the combination of Belhaven 03 and 04 flows, and before the point of entry to the distribution system. The diameter of the distribution system pipe is 12 inches. A chemical storage building and instrumentation building are located toward the west-end of the wellsite.

The Belhaven 03 Well is located in the southeast quadrant of the wellsite and Belhaven 04 is located in the northwest quadrant of the wellsite, as shown in Figure 3.3.

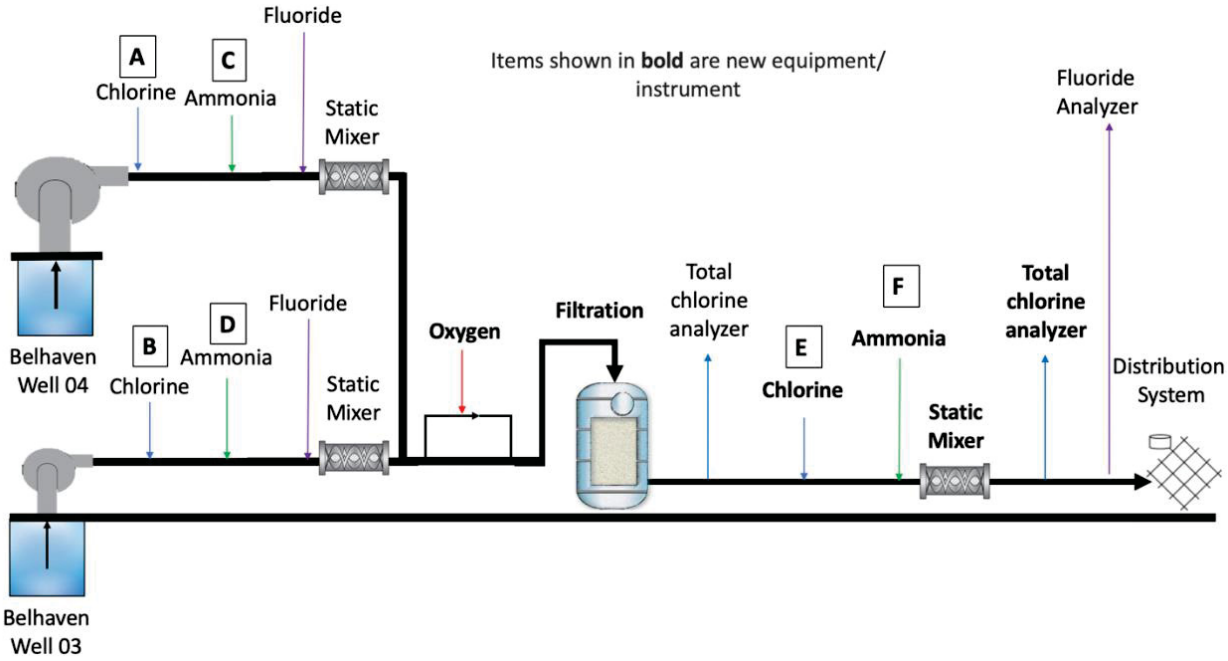
Figure 3.3. Belhaven Wellsite layout (2018).



3.4. Recommended Treatment Processes

The recommended treatment process at Belhaven Wellsite is independent chlorine addition at Belhaven 03 and 04, flow combination, DO augmentation, filtration, chlorine addition (trim point) and chloramine formation, as shown in Figure 3.4.

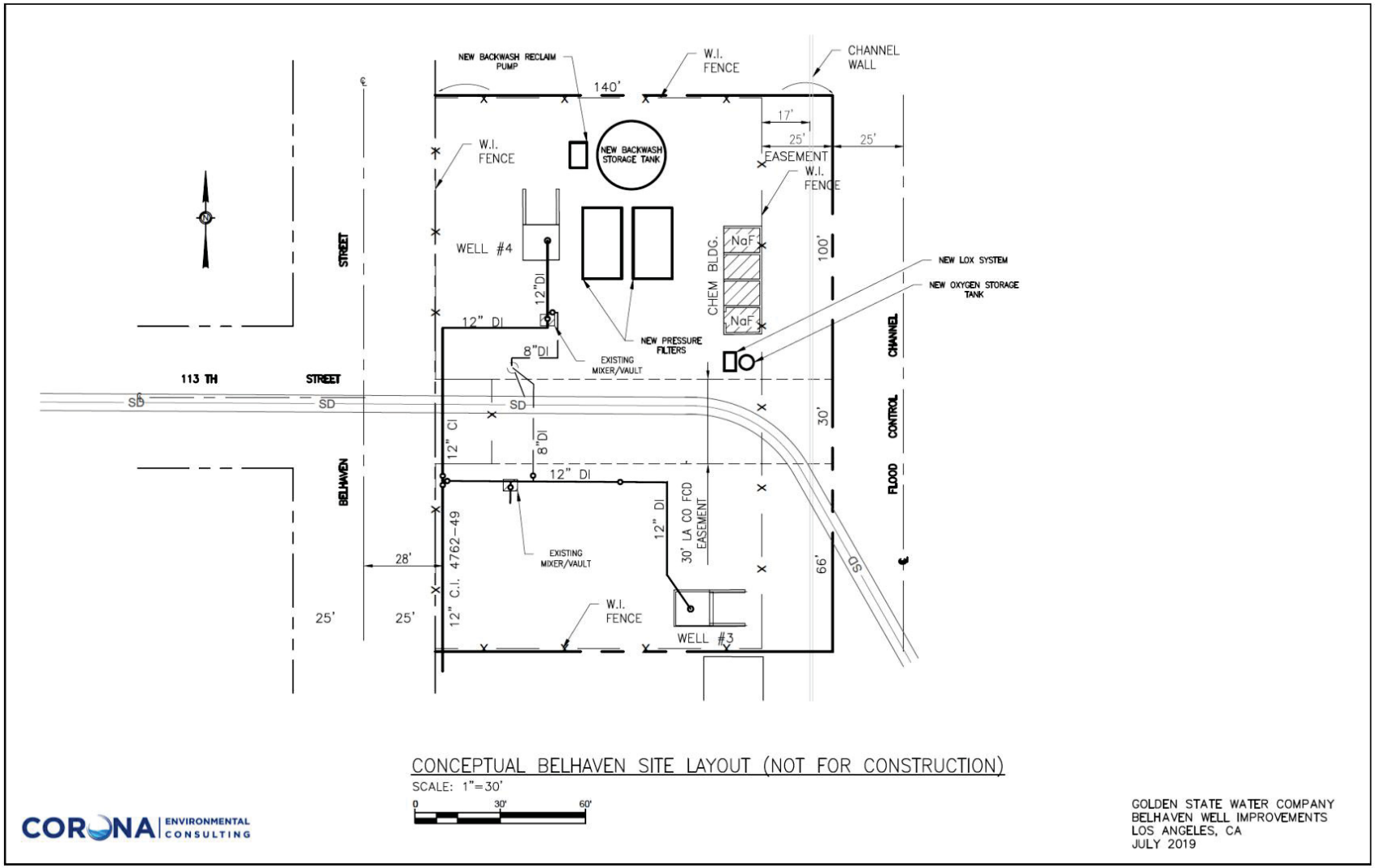
Figure 3.4. Proposed Belhaven process flow diagram where new processes are provided in bold.



Iron and manganese will be removed by filtration with pyrolusite-based media that will be regenerated by chlorine. The chlorine will be dosed separately to the Belhaven 03 and 04 raw water (A and B, respectively). DO augmentation will occur following the blending of the chlorinated waters, by adding liquid oxygen to a side stream of the flow. A chlorine feed point (E) will also be added downstream of the filtration system to trim the chlorine, followed by an ammonia feed point (F) to form chloramines. Ammonia feed points C and D shall remain in-place to provide operational flexibility and resiliency; however, it is expected that normal operations will rely on ammonia being fed at point F. Dosing ammonia at these locations will provide the advantage of allowing additional time for chlorine and ammonia to mix, and allow for more accurate ammonia, monochloramine, and total chlorine measurements. Following the ammonia feed points C and D, fluoride will continue to be fed to Belhaven 04 and 03, respectively.

The existing static mixers will remain in place following the chemical feed points to mix chlorine and ammonia, before the chlorinated water passes through the filtration system. A new static mixer shall be installed downstream of the ammonia feed point F to ensure the water is well mixed prior to the chlorine concentration being measured. A conceptual site layout showing potential locations for the new equipment is provided in Appendix E, and an image of this layout is shown in in Figure 3.5. The purpose of this site layout is to show how equipment could fit on the Wellsite. Considerable changes to this site layout may occur during the design phase. It is anticipated that filtration equipment and the backwash tank will utilize a smaller footprint than what is designated for this equipment in Figure 3.5.

Figure 3.5. Conceptual Belhaven site layout (Not for construction).



3.5. Recommended Improvements

3.5.1. DO Augmentation

Dissolved oxygen will be augmented at the Belhaven Wellsite to achieve a DO concentration between 8 and 10 mg/L at the range of anticipated flow rates between 950 and 2150 gpm. DO will be increased without breaking head, designed based on the functionality of a BlueInGreen SDOX-125® system that dissolves liquid oxygen into a pressurized sidestream of process water to achieve a supersaturated DO solution. The concentrated sidestream of DO will be injected following the mixing of the two individual well flows, and upstream of the filtration system. The SDOX® system is skid-mounted and includes a pump, VFD, pressure vessel, mixing apparatus, piping, and all instrumentation and controls. The VFD allows the DO feed rate to be adjusted between 0 to 100% of its capacity. Details for this system are summarized in Table 3.4.

Table 3.4. Liquid oxygen system details.

Vendor	BlueInGreen
Model	SDOX-125®
Oxygen Feed	Liquid oxygen
Maximum Oxygen Consumption (@2150 gpm; lbs/day)	258
VFD Pump size (HP)	2.5-3.5
Electrical requirements	480V, 3 PH, 60 Hz
Material	Stainless Steel
LOX generation/injection system dimensions	L=6.5 ft, W= 4 ft, H=6.75 ft
LOX storage tank volume (L)	2,707
Oxygen Storage Capacity (scf)	82,239 scf
Storage tank dimensions	D=4.92 ft, H=9.74 ft
Side stream (inlet/outlet) pipe diameter (in)	1.25
Controls	PLC

The liquid oxygen that will be used to make the concentrated sidestream will be supplied by Airgas. Liquid oxygen will be stored in a 3,000 L storage tank that will be leased from Airgas. This tank can store greater than 25, 46, 58 days of the needed oxygen supply when Belhaven 03 and 04 are online, only Belhaven 04 is online, and only Belhaven 03 is online, respectively.

3.5.2. Filtration

Filtration systems shall satisfy the following requirements:

- Sized to accommodate a flow range from 950 to 2150 gpm
- Vessels can be either horizontally or vertically configured
- System must be capable of producing treated water iron concentrations consistently less than 0.02 mg/L
- Media — pyrolusite based

- Hydraulic loading rate — provide at least three examples where a system using the proposed media has been successfully permitted in California at or above the proposed hydraulic loading rate, where the primary purpose was manganese removal. The proposed hydraulic loading rate shall be calculated assuming one vessel/cell is out of service for backwash and account for the additional flow of reclaim water from the backwash tank.
- Filtration system footprint — TBD by design engineer
- Backwash supply must be provided from process water without additional provisions for onsite storage when Belhaven 03 and 04 are both online, or when one well is offline
- Maximum clean-bed headloss of 10 psi and a maximum headloss of 20 psi prior to backwash, across the entire treatment system

The backwash reclamation system shall satisfy the following requirements:

- Maximum backwash storage tank height — Height: 16 ft
- Backwash tank volume — vendor shall supply calculations validating that the backwash tank is appropriately sized, such that the filtration system can operate continuously using the proposed backwash hydraulic loading rate and backwash duration.
- Backwash reclaim pump — Design flow rate: 215 gpm @ a discharge pressure of 105 psi

3.5.3. Chemical Addition

Chemical metering pumps shall dose 12.5% sodium hypochlorite and 5-19.9% ammonium hydroxide at the locations shown in the recommended process flow diagram (Figure 3.4). The existing fluoride addition system will continue to be used with no required modifications. Chemical details are provided in Appendix F. The status and chemical feed rates of the chemical feed pumps are provided in Table 3.5.

Table 3.5. Sodium hypochlorite and ammonium hydroxide addition details.

Location[1]	Chemical	Status	Anticipated dose (mg/L)	Anticipated dose (mg-N/L)	Chemical feed Rate (gph)
A	Sodium hypochlorite	In place and sized appropriately	4.3	-	1.6-2.6[2]
B	Sodium hypochlorite	In place and sized appropriately	4.6	-	2.2-3.5[2]
C	Ammonium hydroxide	In place and sized appropriately	-	0.64	0.2[3]-0.8[4]
D	Ammonium hydroxide	In place and sized appropriately	-	0.64	0.3[3]-1.0[4]
E	Sodium hypochlorite	To be procured & installed	3.0	-	1.1-4.0[2]
F	Ammonium hydroxide	To be procured & installed	-	0.64	0.2[3]-1.8[4]

[1]Locations are provided in Figure 3.4, [2]Assumes 12.5% hypochlorite stock decays up to 8%, [3]Assumes ammonium hydroxide stock concentrations as high as 19.9% and [4]Assumes ammonium hydroxide stock concentrations of 5% (see Appendix F).

The range of chemical feed rates provided in Table 3.5 account for (i) changes in flow rates with the maximum flow rate occurring at 2,150 gpm, when both Belhaven 03 and 04 wells are in operation, and the minimum occurring at 950 gpm, when only Belhaven 03 is online and Belhaven 04 is offline and (ii)

the range of possible chemical stock concentrations. Table 3.6 shows the chemical storage requirements after the recommended improvements are implemented at the Belhaven Wellsite.

Table 3.6. Chemical storage requirements.

Belhaven 03 Design Flow	950 gpm
Belhaven 04 Design Flow	1,200 gpm
Sodium Hypochlorite Storage Capacity	525 gallons
Ammonium Hydroxide Storage Capacity	240 gallons
Daily Sodium Hypochlorite Consumption[1]	92 – 144 gal/day
Daily Ammonium Hydroxide Consumption[2]	13 – 50 gal/day
Sodium Hypochlorite Refill Frequency[1]	4 – 6 days
Ammonium Hydroxide Refill Frequency[2]	5 – 19 days

[1]Assumes 12.5% hypochlorite stock decays up to 8%, [2]Assumes ammonium hydroxide stock concentrations as high as 19.9%. and as low as 5% (see Appendix F).

During the design phase, the design engineer should verify with GSWC staff if the chemical refill frequencies are feasible, if it is not then chemical storage should be increased either by upgrading the storage tank or adding another bay for chemical storage.

3.5.4. Analyzers

An existing total chlorine analyzer shall measure chlorine downstream of the filters. This will be used to determine the required chlorine dose, if any, at the downstream chlorine feed point E. This will be followed by a new total chlorine analyzer. The existing fluoride analyzer will continue to measure fluoride concentrations following the new static mixer.

4.0 Southern 05 Wellsite

The Southern 05 Wellsite contains the Southern 05 Well, whose raw water contains regulated contaminants including iron and manganese, which are currently addressed by filtration. Additional water quality issues could be caused by the mixing of the wells' groundwater and the MWD surface water which have dissimilar DO concentrations. Thus, increasing DO levels in the Southern 05 Well's groundwater may stabilize water quality in the distribution system.

Based on the three phases of work described in Section 1.0, the proposed treatment train at the Southern West Plant Wellsite is as follows:

4.1. Site Overview

The Southern Wellsite, shown in Figure 4.1, is located at 13503 S. Vermont Ave. Gardena, CA 90247. It contains the Southern West Plant, which treats water from the Southern 05 Well. The well produces water at a rate of 900 gpm. The well pump diagram and details are provided in Appendix G.

Figure 4.1. Southern Wellsite with the Southern West WTP outlined in red that treats water from the Southern 05 Well.

Between January 2014 and December 2018, the Southern 05 Well was utilized on average at 67% (Table 4.1). It should be noted that between most of June 2015 and August 2016, the well was offline.

Table 4.1. Southern 05 Well capacity and average production.

Parameter	January 2014- December 2018
Capacity (gpm)	900
Average annual production (MG)	318
Utilization (%)	67

4.2. Water Quality

A summary of relevant water quality parameters collected in 2018 from the Southern 05 Well raw and finished water locations is shown in Table 4.2.

Table 4.2. Water quality parameters collected Southern Well 05 raw and finished water between August and October 2018. Averages of historical data were collected between 2009 and 2018.

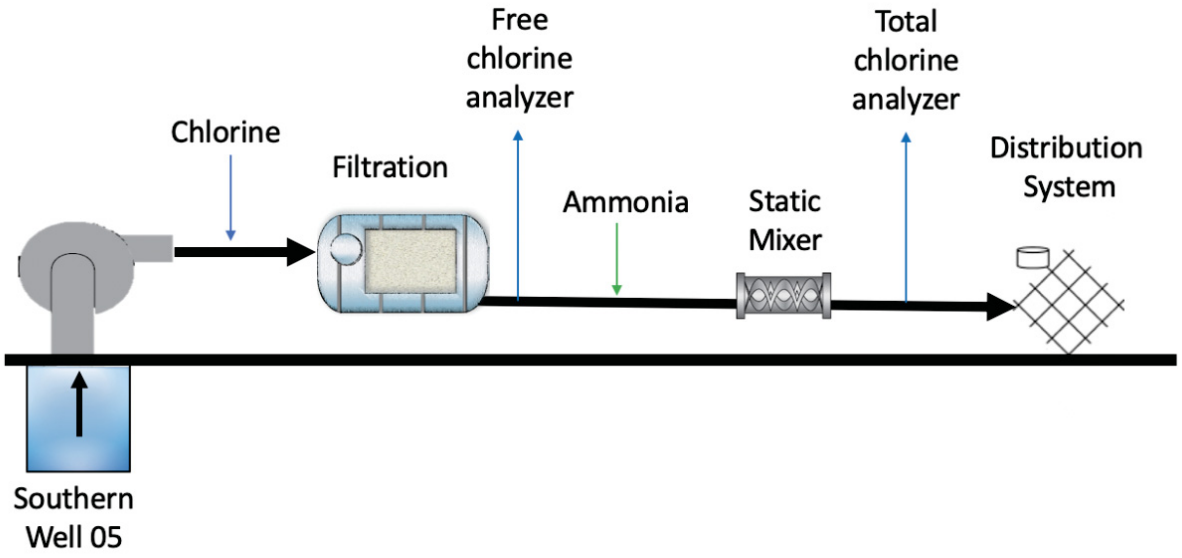
Analyte	Southern 05					
	Raw			Finished		
	Range	Average or Result	Historical average or result	Range	Average or Result	Historical average or result
Color (CU)	-	ND	2.4	-	ND	-
DO (mg/L)	0.16-0.37	0.28	-	0.23-0.70	0.45	-
Total Ammonia (mg-N/L)	ND-0.05	ND	-	0.59-0.72	0.65	-
Total Chlorine (mg-Cl_2/L)	-	-	-	2.7-3.45	3.05	3.23
Total Iron (mg/L)	0.058-0.064	0.061	0.030	ND-0.026	ND	-
Total Manganese (mg/L)	0.050-0.053	0.052	0.050	ND-0.015	0.004	ND
TOC (mg/L)	0.28-1.40	0.61	0.35	0.27-2.60	1.46	-

A key item to note from Table 4.2 is the low ammonia concentration (≤0.05 mg-N/L), which as defined in previous phases of the project, negates the need for the breakpoint chlorination recommended to treat several other Southwest wells. Furthermore, color levels have been near or below the detection limit and the benefit of using breakpoint chlorination to decrease color associated with organics is irrelevant. Total chlorine concentrations in the finished water have also been acceptable. Raw water manganese concentrations have exceeded the secondary maximum contaminant level, and both raw water iron and manganese concentrations exceed the GSWC internal water quality goals presented in Table 1.1. While the raw water iron concentration is less than its regulated limit, during previous phases of this project it was decided that iron and manganese should be treated to below detection limits to inhibit iron and manganese accumulation and release in the distribution system. The iron and manganese filtration system (discussed below) removes these contaminants to acceptable levels in the finished water. DO levels in the raw and finished water do not satisfy the water quality goal.

4.3. Existing Treatment Processes

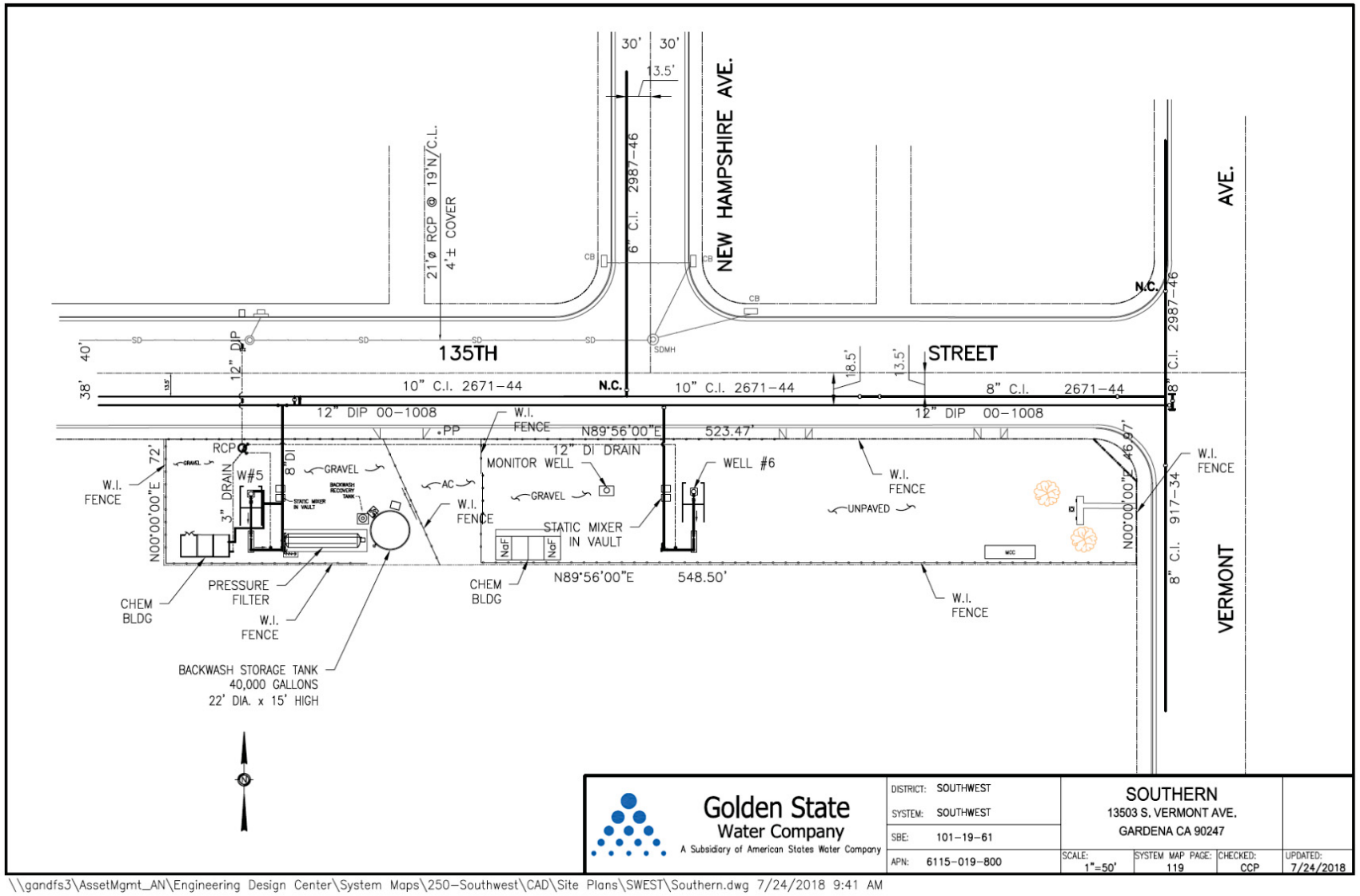
The existing treatment processes in the Southern West Plant, illustrated by the process flow diagram in Figure 4.2, includes chlorine addition, filtration, and chloramine formation.

Figure 4.2. Existing Southern 05 process flow diagram.



The Southern 05 Well, shown in the existing site layout in Figure 4.3, is located on the west side of the Southern Wellsite. Raw water piped from the south-east is injected with liquid sodium hypochlorite to oxidize iron and manganese, and to regenerate the MnO_2-containing media in the downstream pressure filter. The horizontal pressure filter is used to remove iron and manganese. Free chlorine concentrations are measured in the filter effluent. Chlorinated water exiting the filter is injected with liquid ammonium hydroxide to form monochloramine, which is then mixed through a static mixer. Total chlorine levels are monitored in chloraminated water. Water is then piped north, where it enters the distribution system. The diameter of the distribution system pipe is 12 inches. The chemical storage and instrumentation buildings are located in the southwest corner of the Wellsite.

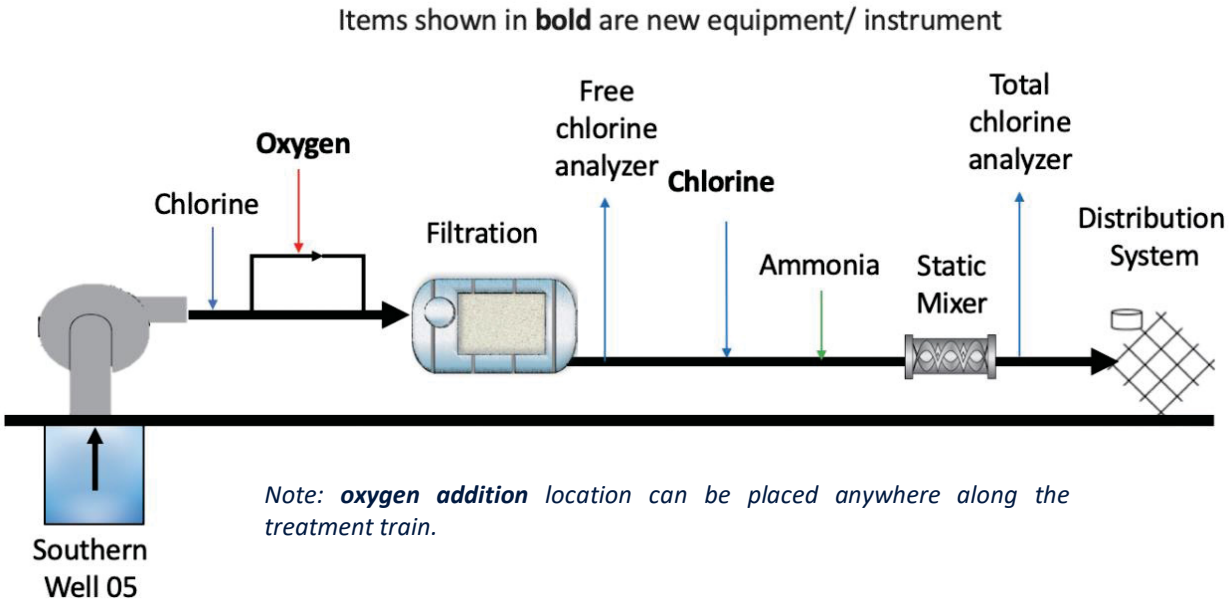
Figure 4.3. Southern 05 Wellsite layout (2018).



4.4. Recommended Treatment Processes

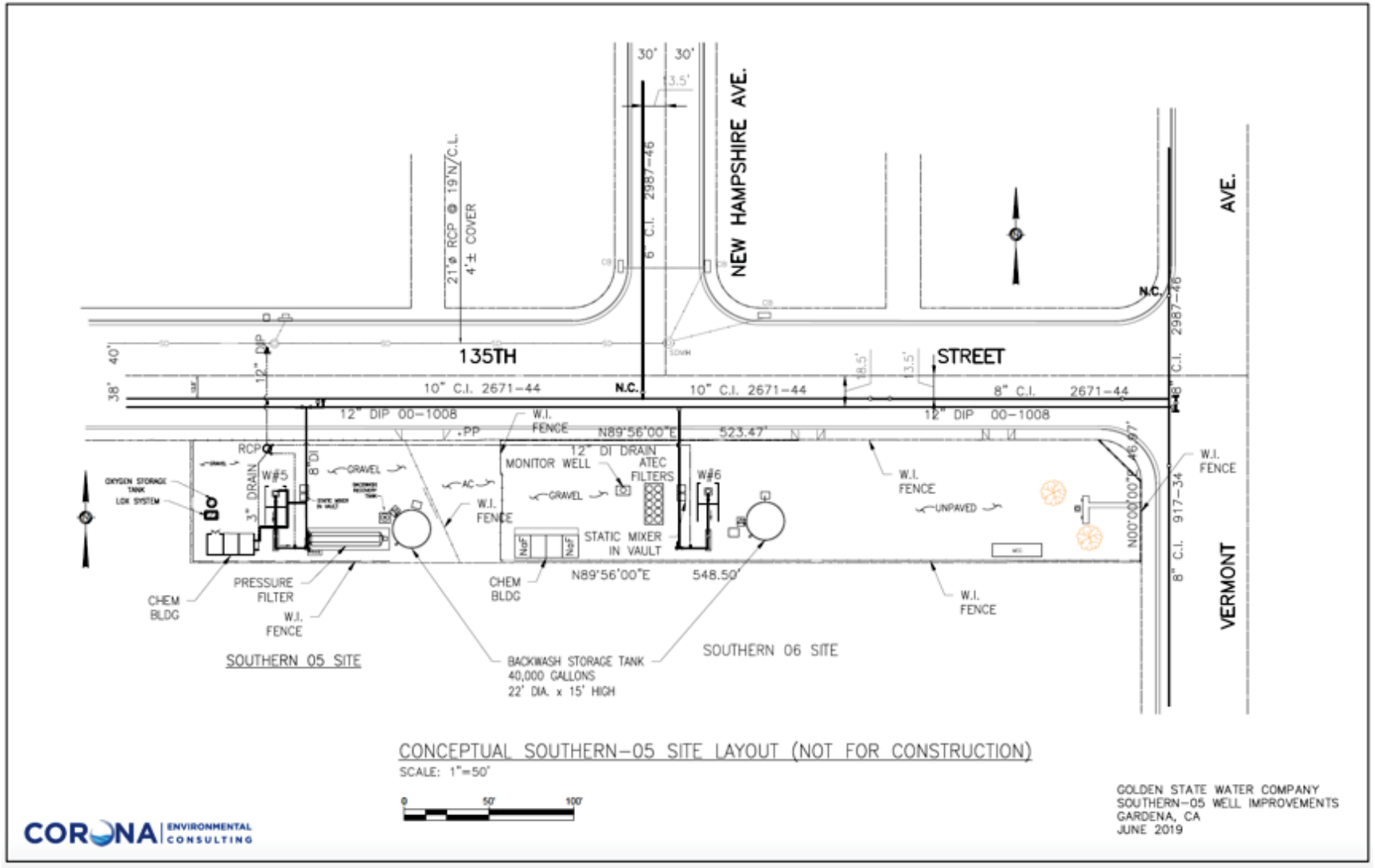
The recommended treatment process at the Southern Wellsite is chlorine addition, filtration, DO augmentation and chloramine formation, as shown in Figure 4.4.

Figure 4.4. Proposed Southern 05 process flow diagram where new processes are provided in bold.



Dissolved oxygen augmentation in the treatment train will be achieved by adding liquid oxygen to satisfy the water quality goal. A second chlorine feed point will also be added downstream of the free chlorine analyzer, and upstream of the ammonia addition point to trim the chlorine. A conceptual site layout, showing a potential location for the liquid oxygen system to the west of the Southern 05 Well, is provided in Appendix H. An image of this layout is shown in Figure 4.5. The purpose of this site layout is to show how the equipment could fit on the Wellsite. It is possible during the design phase that the location will change.

Figure 4.5. Conceptual Southern 05 layout (Not for construction).



4.5. Recommended Improvements

4.5.1. DO Augmentation

Dissolved oxygen will be augmented at the Southern 05 Wellsite to achieve a DO concentration between 8 and 10 mg/L. DO will be increased without breaking head, designed based on the functionality of a BlueInGreen SDOX-125® system that dissolves liquid oxygen into a pressurized sidestream of process water to achieve a supersaturated DO solution. The concentrated sidestream of DO can be injected downstream of the first chlorine injection location and upstream of the filtration vessel. However, this location can be relocated to any other location along the treatment train if desired. The SDOX® system is skid-mounted and includes a pump, VFD, pressure vessel, mixing apparatus, piping, and all instrumentation and controls. Details for this system are summarized in Table 4.3.

Table 4.3. Liquid oxygen system details.

Vendor	BlueInGreen
Model	SDOX-125®
Oxygen Feed	Liquid oxygen
Maximum Oxygen Consumption (lbs/day)	144
VFD Pump size (HP)	2.5-3.5
Electrical requirements	480V, 3 PH, 60 Hz
Material	Stainless Steel
LOX generation/injection system dimensions	L=6.5 ft, W= 4 ft, H=6.75 ft
LOX storage tank volume (L)	2,707
Storage tank dimensions	D=4.92 ft, H=9.74 ft
Side stream (inlet/outlet) pipe diameter (in)	1.25
Controls	PLC

Liquid oxygen that will be used to make the concentrated sidestream will be supplied by Airgas. Liquid oxygen will be stored in a 3,000 L storage tank that will be leased from Airgas.

4.5.2. Chemical Addition and Analyzers

The existing chlorine metering pump that adds chlorine to raw Southern 05 Well water has a capacity of 2.99 gph and will continue to dose chlorine at the existing feed point. An additional chemical metering pump specified for dosing 12.5% sodium hypochlorite at a maximum flow of 1.9 gph shall be used to dose chlorine downstream of the free chlorine analyzer and upstream of the ammonium hydroxide feed location. The additional chlorine injection point will enable chlorine to be adjusted to the desired level exiting the Wellsite in the event that the chlorine demand across the filter fluctuates. The existing ammonia metering pump that has a capacity of 0.95 gph shall be used to dose ammonia downstream of the secondary chlorine addition point, and upstream of the static mixer. A total chlorine analyzer will then monitor chlorine concentrations prior to the point of entry to the distribution system. The existing total and free chlorine analyzers will continue to measure total chlorine and free chlorine levels, respectively, at their existing monitoring locations. Chemical details are provided in Appendix F. Table 4.4 shows the

chemical storage and feed requirements after the recommended improvements are implemented at the Southern 05 Wellsite.

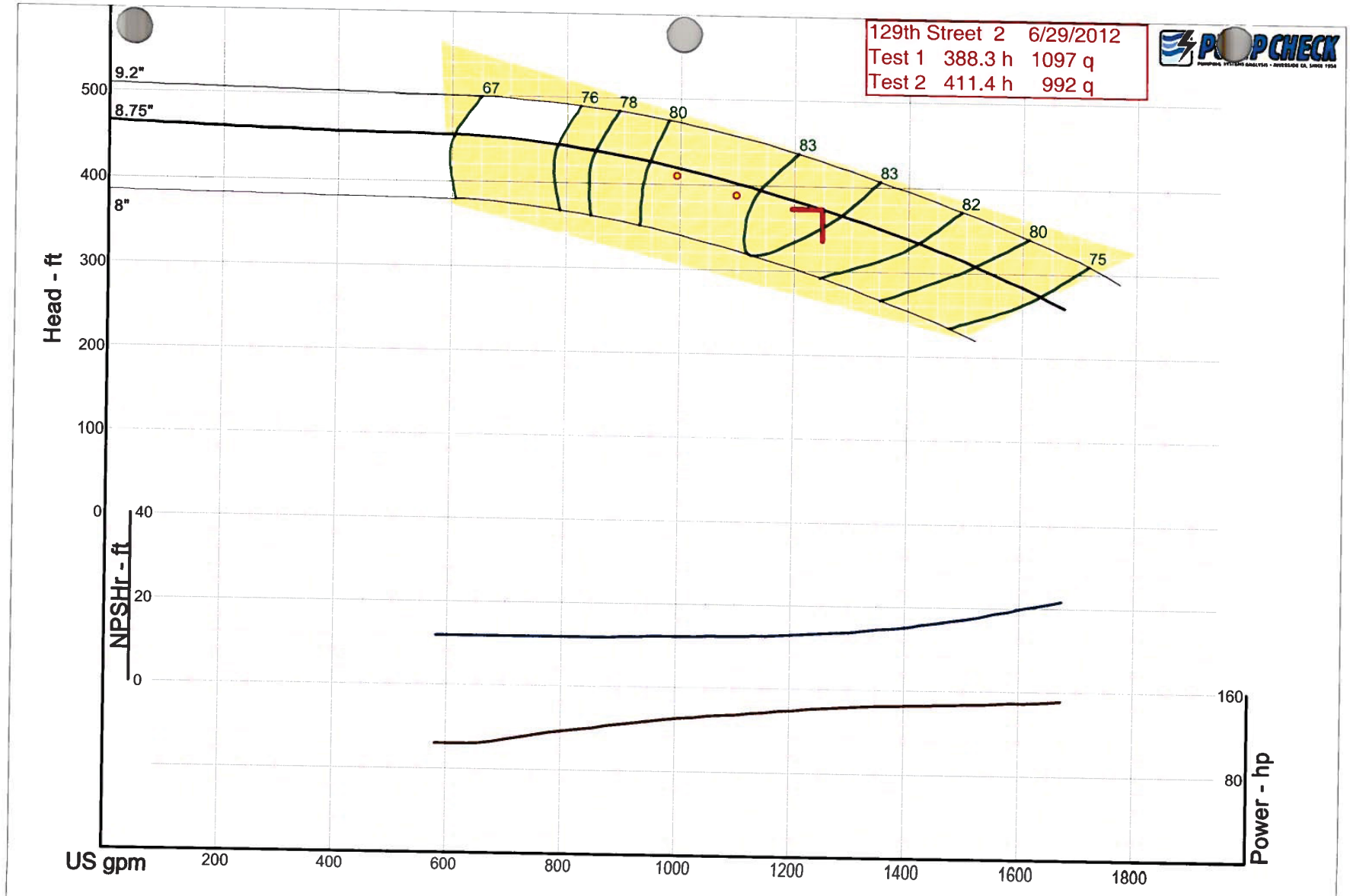
Table 4.4. Chemical storage and feed requirements.

Design Flow	900 gpm
Sodium Hypochlorite Storage Capacity	500 gallons
Ammonium Hydroxide Storage Capacity	240 gallons
Sodium Hypochlorite Feed Pump Capacity	2.99 gph
Ammonium Hydroxide Feed Pump Capacity	0.95 gph
New Sodium Hypochlorite Feed Pump Capacity	1.9 gph
Recommended Chlorine Dose	4.8 mg/L
Recommended Ammonia Dose	0.64 mg-N/L
Daily Sodium Hypochlorite Consumption[1]	43 – 64 gal/day
Daily Ammonium Hydroxide Consumption[2]	5 – 20 gal/day
Sodium Hypochlorite Refill Frequency[1]	8 – 12 days
Ammonium Hydroxide Refill Frequency[2]	12 – 48 days

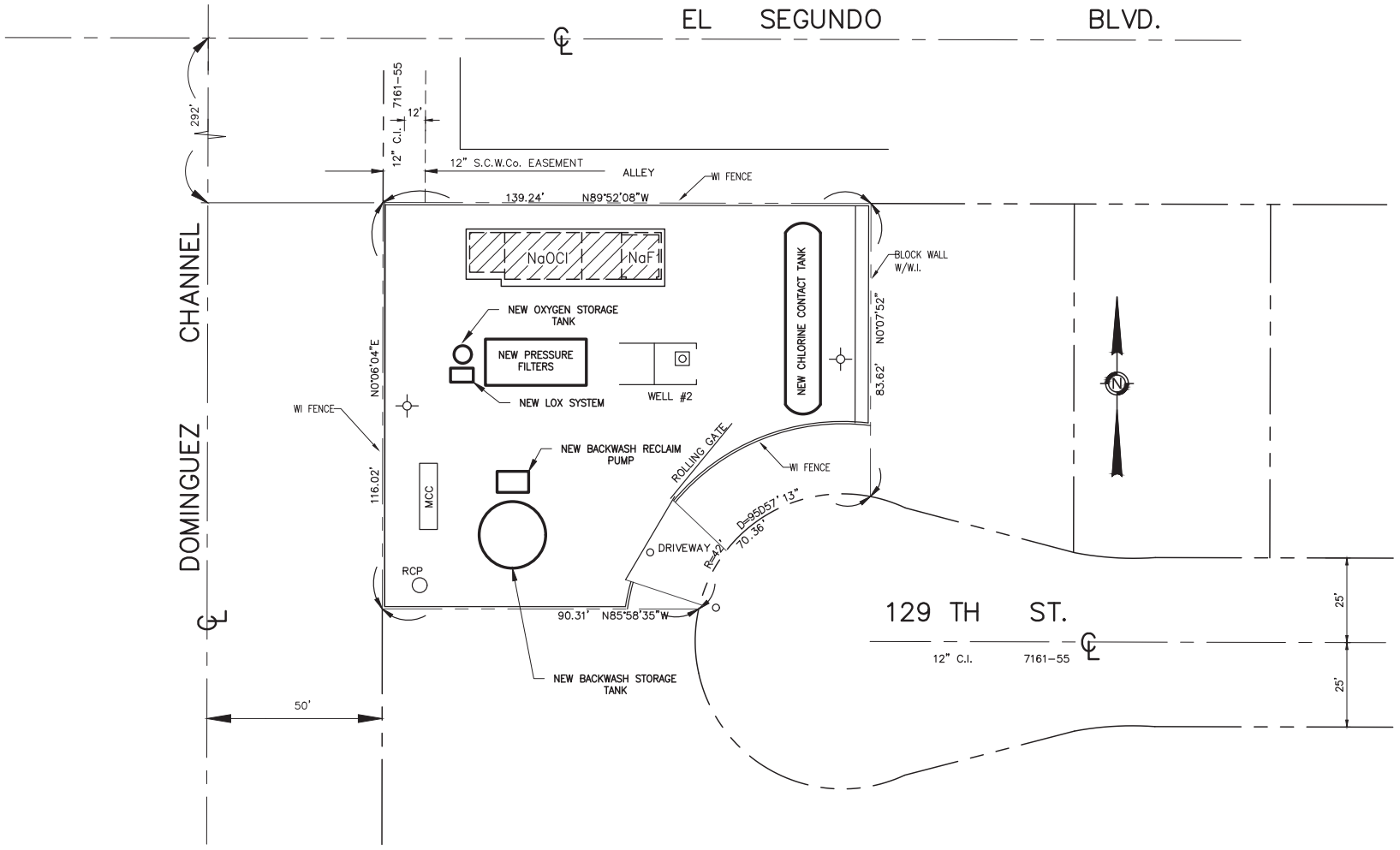
[1]Assumes 12.5% hypochlorite stock decays up to 8%, [2]Assumes ammonium hydroxide stock concentrations as high as 19.9%. and as low as 5% (see Appendix F).

During the design phase, the design engineer should verify with GSWC staff if the chemical refill frequency for sodium hypochlorite is feasible, if it is not then chemical storage should be increased either by upgrading the storage tank or adding another bay for chemical storage.

Appendix A — 129th St. Wellsite Pump Curve


129th Street 2 6/29/2012
Test 1 388.3 h 1097 q
Test 2 411.4 h 992 q
PUMP CHECK
9.2"
8.75"
8"
67
76
78
80
83
83
82
80
75
Head - ft
500
400
300
200
100
0
NPSHr - ft
40
20
0
160
80
Power - hp
US gpm
200
400
600
800
1000
1200
1400
1600
1800
Suction Size-10" Discharge Sizes-8",10". Curves are certified for water at 60°F only. Consult factory for performance with any other fluid.
Company: GSWC Southwest
Name: 129th Street 2
09/11/11
Turbine 60 Hz
Catalog: Goulds Lineshaft 60HZ, vers 3.34
Lineshaft - 1800
Design Point: 1250 US gpm, 374 ft
Size: 13CHC 5 stages
Speed: 1770 rpm
Dia: 8.75 in
Curve: 3135-1

Appendix B — 129th St. Wellsite Site Layout Drawing



CONCEPTUAL 129TH ST. SITE LAYOUT (NOT FOR CONSTRUCTION)

SCALE: 1"=30'

0 30' 60'

CORONA ENVIRONMENTAL CONSULTING

GOLDEN STATE WATER COMPANY
129TH ST. WELL IMPROVEMENTS
GARDENA, CA
JULY 2019

CORONA ENVIRONMENTAL CONSULTING

Appendix C — Baffled Pressurized Vessel Volume Calculation

BF_f = Baffling factor of filter = 0.7

BF_v = Baffling factor of baffled, pressurized vessel = 0.7

V_f = Total empty bed volume of filtration vessels

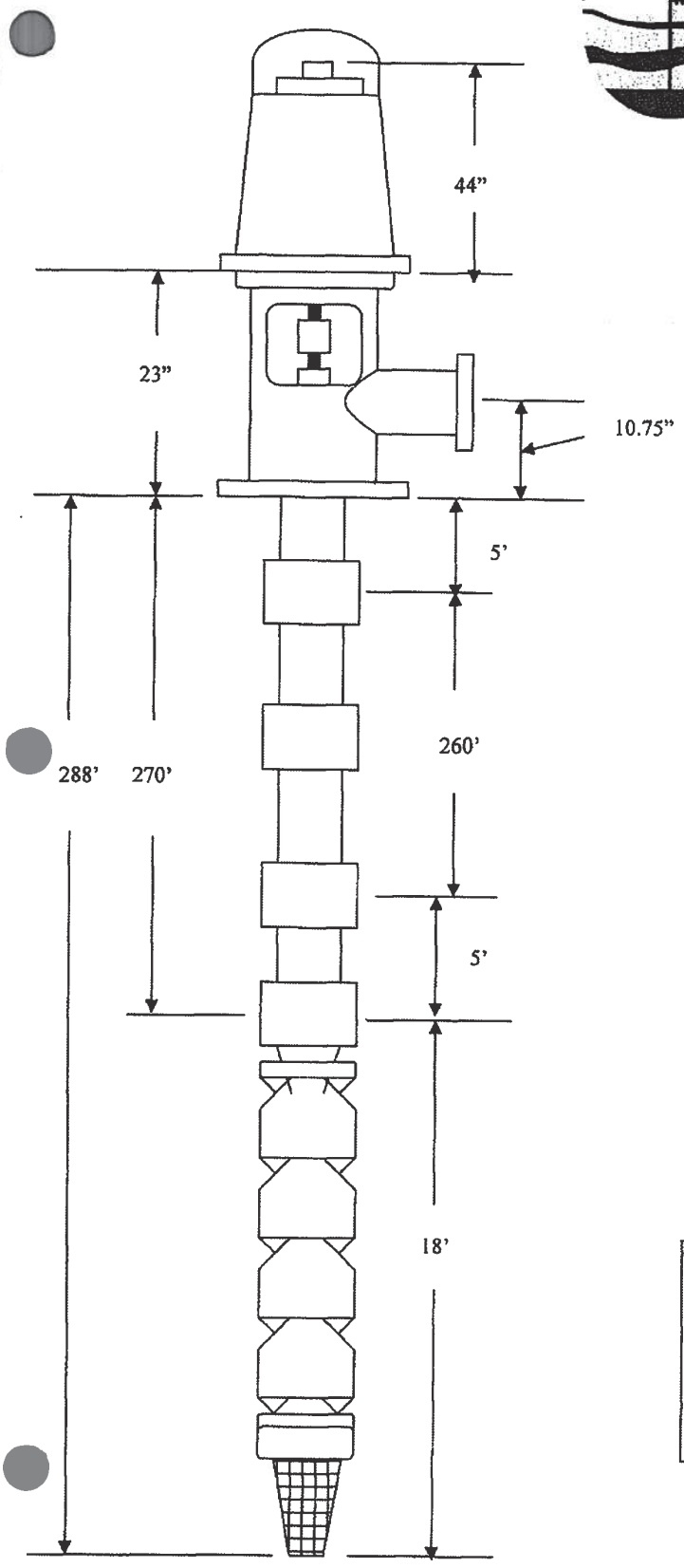
V_v = Minimum volume of baffled, pressurized vessel(s)

Q = Design capacity = 1,250 gpm

T_{10} = effective contact time = 20 min

$$V_v = \frac{Q\left(T_{10} - BF_f\left(\frac{V_f}{Q}\right)\right)}{BF_v}$$

Appendix D — Belhaven 03 and 04 Well Pump Diagrams and Details



Date: 5/4/16
Customer: Golden State Water Company
Job Name: Belhaven Well #3
Job Number: 20838

Motor:
H.P.: 200 MFG: US
RPM: 1785 Type: VHS
Voltage: 460 Amps: 228
ID: H12 82000167-008R

Discharge Head:
Type: Water Lube Size: 12" x 20"
Material: Cast Iron
MFG: Goulds

Column Assembly:
Pipe size/length: 8" x 270'
Shaft size/length: 1-1/2" x 270'
Retainers: 8" x 1-1/2" 201 SS w/rubber inserts

Airline:
Size: ¼" Length: 270'
Material: stainless steel PVC jacketed

Sounding Pipe:
Size: 1" Length: 270'
Material: Schedule 80 PVC

Bowl Assembly:
GPM: 1000 TDH: 400'
Mod: 12KC Stgs: 6
MFG: Hydroflo
Open Line Shaft

Materials:
Bowl: Cast Iron Impellers: 201 SS
Shft: 17-4 PH Brg: Brass
Collets: SS Bolts: SS

Suction Pipe and Strainer:
Suction Pipe: 8" Length: 10'
Material: Steel Cone Strainer: SS

Other:
Well Dia:
Well Depth:

Best Drilling and Pump, Inc.
Our Goal Is in Our Name

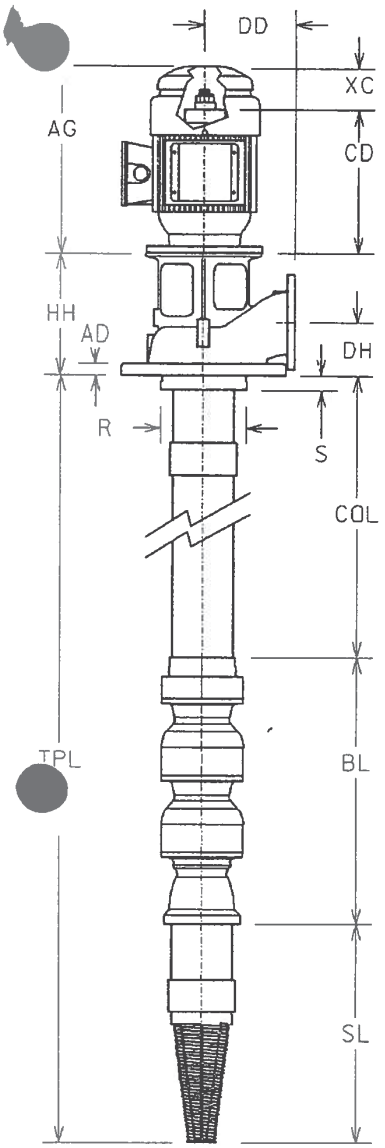
1640 Pellisier Road
Colton, CA 92324
Phone 951-684-1952 Fax 951-684-3852

CHRISTENSEN PUMPS
MEMPHIS, TENNESSEE
Belhaven # 4

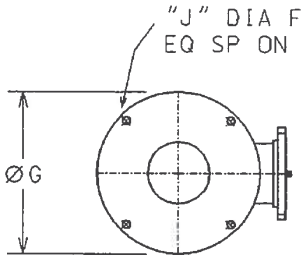
HYDRAULIC ANALYSIS

DWT-CATM
7 Stage 10x12CMC

Christensen Pumps
A division of
Layne Christensen Company



AD:	1.13
AG:	50.06
BD:	16.5
BL:	91.50
CAN:	N/A
CD:	44.78
CL:	N/A
COL:	250.0'
DD:	14.00
DH:	9.25
G:	25.00
H:	22.75
HH:	19.00
J:	0.75
R:	14.60
S:	2.38
SL:	22.00
TPL:	259.5'
UG:	N/A
V:	
W:	
X:	
XC:	5.13
Y:	
Z:	
MAX:	11.75



DISC HEAD

Pump Data

Size:	12CMC
Stages:	7
Impellers:	See Sectional
Bowl:	See Sectional
BowlShaft:	416SS 1.69"
Lineshaft Bearing:	Rubber
LineShaft Matl:	C-1045 1.5"
LineShaft Type:	Open
Column:	Standard Steel
Column:	10" Threaded
Bearing Spacing:	10 feet
Section Length:	10 feet
Head:	A:Cast
Flange (Disch.):	10" 125#
Inlet:	
Lineshaft Coupling:	C1018
Seal:	Packing
Strainer:	Cone
SubBase:	None

Hydraulic Data

Flow (gpm):	1000
Pump Head (ft):	313.4
TDH (ft):	461.0
Speed (rpm):	1770
Fluid:	Water
Temperature (F):	60
Viscosity:	1.105
Sp. Grav:	1

Miscellaneous

Thrust At Design:	4942
Thrust At Shutoff:	5977
Min Water Level(in):	1740

Weight

Pump:	12323
Motor:	1350
Total:	13673

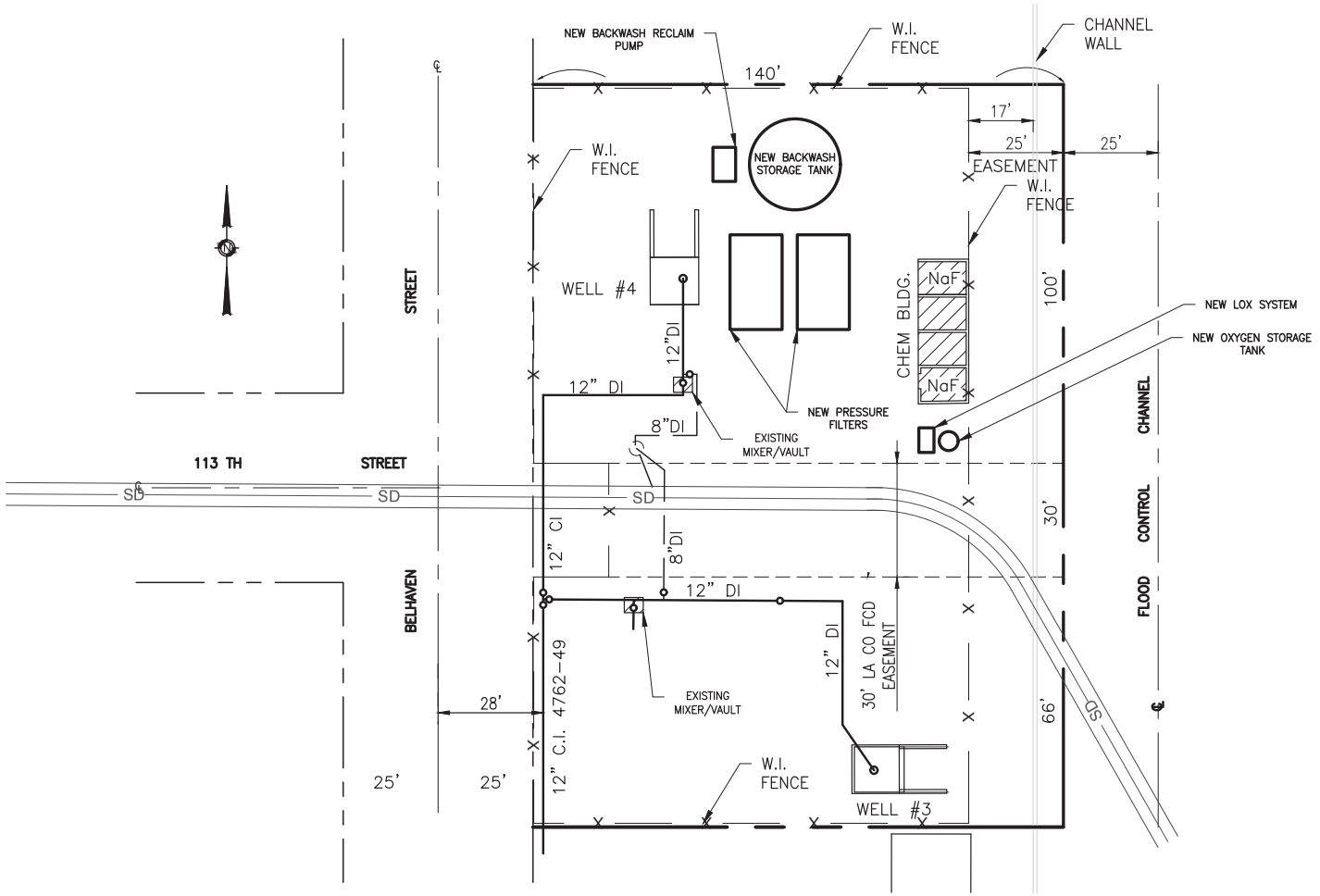
Motor Data

Model:	BF75
Make:	USEM
HP:	150
RPM:	1800
Type:	RUSI
Efficiency:	96.2
Frame:	H444TP
Ratchet:	SRC

Version: 3.11C

Date: 04-11-2005

Appendix E — Belhaven Wellsite Site Layout Drawing



CONCEPTUAL BELHAVEN SITE LAYOUT (NOT FOR CONSTRUCTION)

SCALE: 1"=30'

0 30' 60'

CORONA ENVIRONMENTAL CONSULTING

GOLDEN STATE WATER COMPANY
BELHAVEN WELL IMPROVEMENTS
LOS ANGELES, CA
JULY 2019

Appendix F — Chemical Stock Details

MULTI-CHLOR

Safety Data Sheet

12.5% Sodium Hypochlorite

Emergency 24 Hour Telephone: **CHEMTREC 800.424.9300**

Corporate Headquarters: Hasa Inc.
P.O. Box 802736
Santa Clarita, CA 91355
Telephone • 661.259.5848
Fax • 661.259.1538

SECTION 1: IDENTIFICATION			
1.1	**Product Identification:**		
	1.1.1	**Product Name:**	MULTI-CHLOR
	1.1.2	**CAS #** (Chemical Abstracts Service)**:**	7681-52-9
	1.1.3	**RTECS** (Registry of Toxic Effects of Chemical Substances)**:**	NH3486300
	1.1.4	**EINECS** (European Inventory of Existing Commercial Substances)**:**	231-668-3
	1.1.5	**EC Number:**	231-668-3
	1.1.6	**Synonym:**	Bleach, Hypo, Hypochlorite, Liquid Chlorine Solution
	1.1.7	**Chemical Name:**	Sodium Hypochlorite
	1.1.8	**Chemical Formula:**	NaOCl
1.2	**Recommended Uses:**		Sanitizer of swimming pool and spa water.
1.3	**Company Identification:**		Hasa Inc. P. O. Box 802736 Santa Clarita, CA 91355
1.4	**Emergency Telephone Number:**		**CHEMTREC** 1-800-424-9300 (24 hour Emergency Telephone)
1.5	**Non-Emergency Assistance:**		661-259-5848 (8 AM – 5 PM PST / PDT)

SAFETY DATA SHEET

Aqua Ammonia (5-19.9%)

Airgas
an Air Liquide company

Section 1. Identification

GHS product identifier : Aqua Ammonia (5-19.9%)

Other means of identification : Aqua Ammonia, Ammonium Hydroxide

Product type : Liquid.

Product use : Synthetic/Analytical chemistry.

Synonym : Aqua Ammonia, Ammonium Hydroxide

SDS # : 001196

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN CORROSION - Category 1B
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
AQUATIC HAZARD (ACUTE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : May displace oxygen and cause rapid suffocation.
Causes severe skin burns and eye damage.
May cause respiratory irritation.
Very toxic to aquatic life.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.

Response : Collect spillage. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 2. Hazards identification

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Aqua Ammonia, Ammonium Hydroxide

Product code : 001196

Ingredient name	%	CAS number
Aqua Ammonia	100	1336-21-6
WATER	80.1 - 95	7732-18-5
ammonia	5 - 19.9	7664-41-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : May cause respiratory irritation.

Skin contact : Causes severe burns.

SAFETY DATA SHEET

SODIUM FLUORIDE Coarse

Revision Date 11/05/2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name SODIUM FLUORIDE Coarse

1.2 Relevant identified uses of the substance or mixture and uses advised against

Uses of the Substance / Mixture

- Welding and soldering agents
- Metallurgy.
- Glass industry
- Dental application
- Water treatment

1.3 Details of the supplier of the safety data sheet

Company

SOLVAY FLUORIDES, LLC
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: +1-800-7658292; +1-713-5256700
Fax: +1-713-5257805

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture

HCS 2012 (29 CFR 1910.1200)

Acute toxicity, Category 3 H301: Toxic if swallowed.

2.2 Label elements

HCS 2012 (29 CFR 1910.1200)

Pictogram

Signal Word

- Danger

Hazard Statements

- H301 Toxic if swallowed.

Precautionary Statements

Prevention

- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.

Response

- P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.

Storage

- P405 Store locked up.

Disposal

- P501 Dispose of contents/ container to an approved waste disposal plant.

Additional Labeling

- The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 100 %

2.3 Other hazards which do not result in classification

- Toxic if swallowed.
- Irritating to eyes and skin.
- Hazardous decomposition products formed under fire conditions.
- Contact with acids liberates very toxic gas.

SECTION 3: Composition/information on ingredients

3.1 Substance

Hazardous Ingredients and Impurities

Chemical Name	Identification number CAS-No.	Concentration [%]
sodium fluoride	7681-49-4	>= 99

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

3.2 Mixture

Not applicable, this product is a substance.

SECTION 4: First aid measures

4.1 Description of first-aid measures

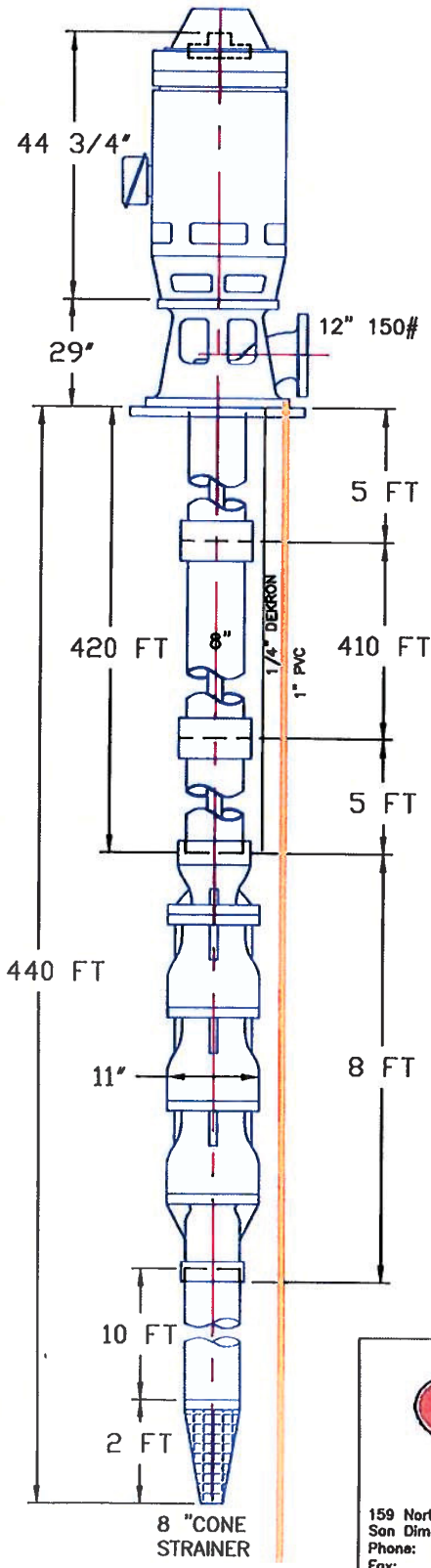
In case of inhalation

- Remove the subject from dusty environment and let him blow his nose.
- Oxygen or artificial respiration if needed.
- If symptoms persist, call a physician.

In case of skin contact

- Take off contaminated clothing and wash before reuse.
- Wash off immediately with soap and plenty of water.
- If symptoms persist, call a physician.

Appendix G — Southern Well 05 Well Pump Diagrams and Details



DATE 02-10-2016
CUSTOMER GOLDEN STATE
JOB NAME SOUTHERN WELL 5

MOTOR
H.P. 150 MFGR. USEM
R.P.M. 1780 FRAME 444TP16
N.R.R or S.R.C. SRC
PHASE/CYCLE/VOLTS 460/60/3
V.H.S. or V.S.S. V.H.S.
MOTOR INFO: BORE 1 1/2
TYPE RUSI
CD = 44 3/4"

DISCHARGE HEAD
TYPE W/L SIZE 24 X 12
MATERIAL CAST IRON
TYPE FLOWSERVE

COLUMN ASSEMBLY
PIPE SIZE/LENGTH 8" / 420'
SHAFT SIZE 1 1/2"
SHAFT MATERIAL 416SS

BOWL ASSEMBLY
G.P.M. 900 T.D.H. 460
MODEL 11M STGS. 8
MFGR. HYDROFLO

MATERIALS:
BOWL IRON IMP. 201SS
SHFT. 17-4SS BRG. BRONZE
COLLET 316SS BOLTS 316SS
BOWL W.R. 316SS
IMP. W.R. 201SS

STRAINER
TYPE CONE
MATERIAL 316SS

OTHER
WELL DIA. 18." - 717FT
MOSS FULL FLOW LOUVER
PERFS 424'-503' 594'-714'
LATERAL LIFT: 3/4" AVAILABLE
LIFT IMPELLERS 1/2" AFTER FREE SPIN

DRAWING NOT TO SCALE

159 North Acacia Street
San Dimas, Ca 91773
Phone: (909) 599-9606
Fax: (909) 599-6238

GENERAL PUMP COMPANY
WATERWELL & PUMP SERVICE SINCE 1952

CUSTOMER: GOLDEN STATE WATER CO SOUTHERN WELL 5

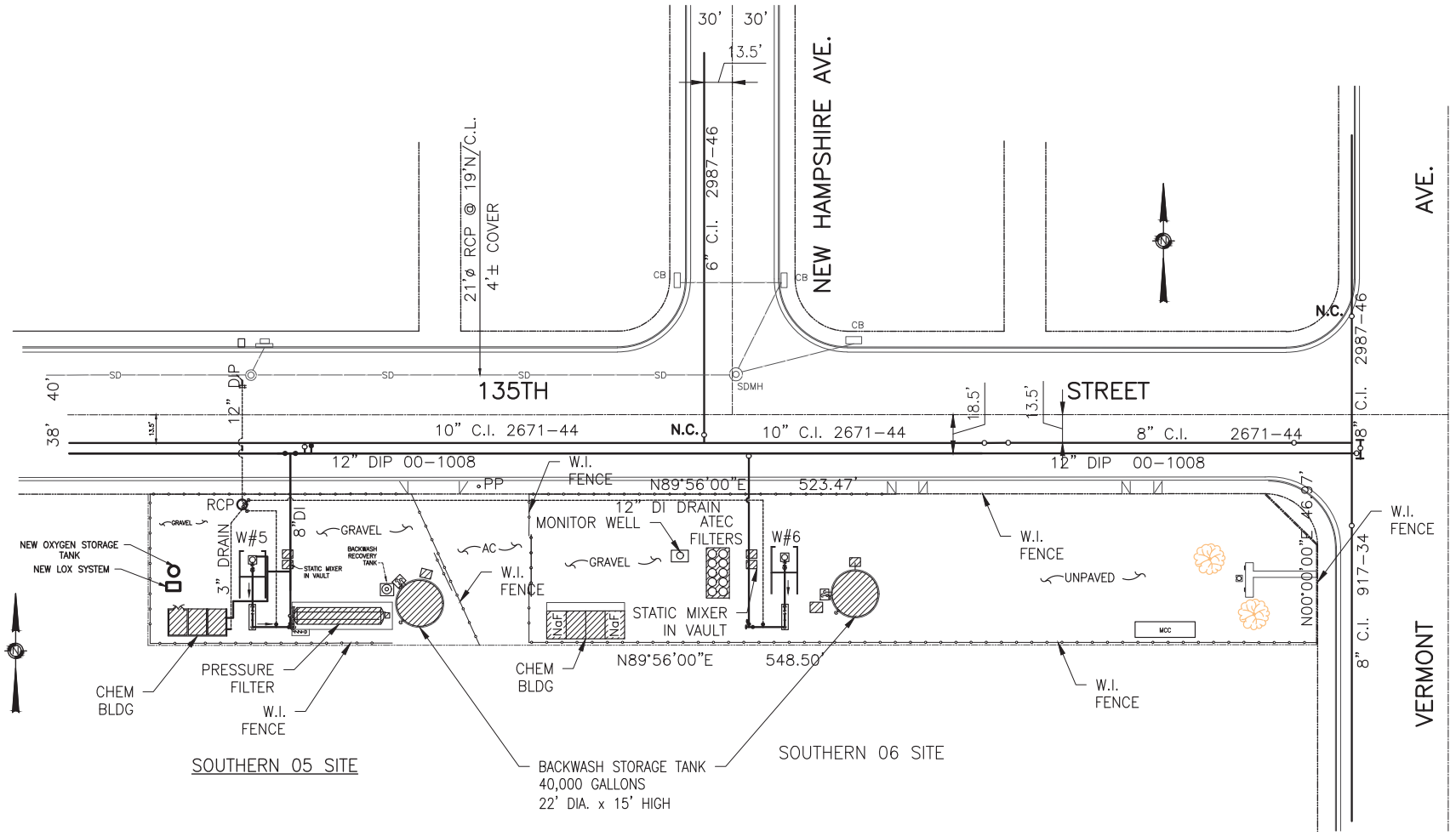
DESCRIPTION : AS BUILT OUTLINE DWG.

STRING WEIGHT : 13,500#'s DRIVER WEIGHT 1,110#'s | DWG NO. 13357AB

PCS. REQ'D : ONE | MATT HINSON ENGINEERING

BY: MATT | DATE: 02-10-2016 | JOB NO. 13357

Appendix H — Southern Wellsite Site Layout Drawing



CONCEPTUAL SOUTHERN-05 SITE LAYOUT (NOT FOR CONSTRUCTION)

SCALE: 1"=50'

0 50' 100'

GOLDEN STATE WATER COMPANY
SOUTHERN-05 WELL IMPROVEMENTS
GARDENA, CA
JUNE 2019

CORONA ENVIRONMENTAL CONSULTING

ATTACHMENT U

CORONA | ENVIRONMENTAL CONSULTING

Golden State Water Company: Southwest Water System Dalton Wellsite Improvements

Basis of Design Report

April 17, 2020

Prepared by Corona Environmental Consulting, LLC

39355 California St., Suite 309 | Fremont, CA 94538 | 510.579.9174 | www.coronaenv.com

CORONA ENVIRONMENTAL CONSULTING

Table of Contents

List of Figures

List of Tables

CORONA ENVIRONMENTAL CONSULTING

Introduction and Background

Golden State Water Company's (GSWC) Southwest System has experienced distribution water quality degradation in the past, such as poor chlorine residuals, nitrification, and colored water events. This degradation was in-part attributed to the variable water quality produced by the blend of GSWC wells, along with treated surface water purchased from the Metropolitan Water District of Southern California (MWD). To improve the water quality in the Southwest system, treatment process improvements have been selected for several of the system's wellsites which were informed by water quality reviews and bench-scale testing.

The Dalton Wellsite consists of the Dalton 01 and Dalton 02 wells, both of which produce water with ammonia, manganese and iron at concentrations above GSWC's water quality goals. Dalton 01 and 02 also have low dissolved oxygen concentrations compared to the purchased MWD surface water that will require augmentation to match. In previous phases of this project, an alternatives analysis was completed for the wellsite to select a treatment design that will achieve GSWC's water quality goals and provide stability for the system's distribution. The proposed treatment process at the Dalton Wellsite is as follows and will be summarized in this basis of design report.

Site Overview

The Dalton Wellsite, shown in Figure 1, is located at 17308 S Dalton Avenue, Gardena, CA 90247. The wellsite consists of the Dalton 01 and Dalton 02 wells, three chemical buildings, two chlorine contact tanks and an electrical panel pad and a Southern California Edison (SCE) transformer. The Dalton wellsite has a combined design capacity of 3,300 gpm with Dalton 01 and 02 having well capacities of 800 gpm and 2,500 gpm respectively. A summary of the Dalton wellsite production data is presented in Table 1, with well pump diagrams and details provided in Appendix A.

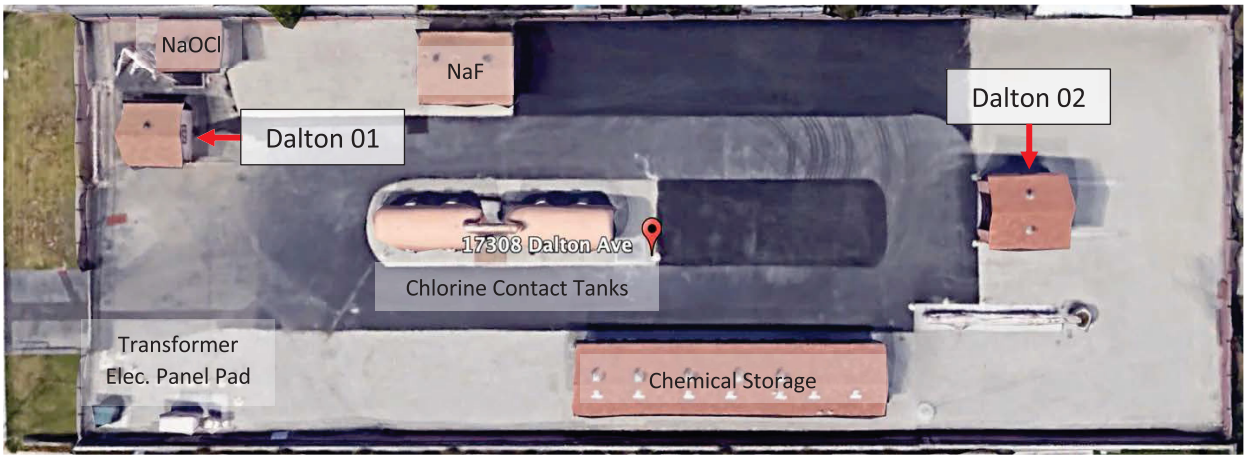


Figure 1 Satellite view of the Dalton Wellsite (Google Earth, 2020).

CORONA ENVIRONMENTAL CONSULTING

Table 1 Production Data for the Dalton 01 well (2009-2018) and Dalton 02 well (2017-2018)

	Dalton 01			Dalton 02		
	Range	Average	Count	Range	Average	Count
Hours Pumped	0.1 – 44.2	23.25	2636	0.0 – 86.7	23.8	354
Flow Rate (gpm)	250 – 1304	705	2627	452 - 2223	1613	353
Production (MGD)	0.00 – 1.51	0.99	2627	0.07 - 3.85	2.30	353

Water Quality

The Dalton 01 and 02 wells produce water with ammonia, and manganese at concentrations above GSWC's water quality goals. The two wells also have low dissolved oxygen concentrations that do not meet GSWC water quality goal of matching MWD water's concentrations. A summary of the Dalton 01 and Dalton 02 raw water quality data are presented in Table 2 and Table 3, respectively.

Table 2 Raw water quality results for the Dalton 01 well (1988-2018)

Parameter	Goal	GSWC Sampling (1988-2017)			Corona Sampling (2018)		
		Range	Average	Count	Range	Average	Count
Alkalinity (mg/L)		174 - 204	189	13	180	180	4
Ammonia (mg-N/L)		-	0.60	1	0.54 - 0.57	0.55	4
Bromide (µg/L)		110 - 113	112	2	100 - 110	108	4
Color (CU)	< 5	0 - 5	2.4	10	ND	ND	4
Dissolved Oxygen (mg/L)	8 - 10	-	-	-	0.29 - 0.41	0.34	4
Total Iron (mg/L)	< 0.1[1]	0 - 0.050	0.042	23	0.039 - 0.067	0.049	4
Total Manganese (mg/L)	< 0.02[2]	0 - 0.040	0.014	23	0.010 - 0.012	0.011	4
pH		6.9 - 8.8	8.1	102	8.1 - 8.3	8.2	4
Odor (TON)	≤ 2	0.5 - 17	2.7	10	0 - 1	0	4
TOC (mg/L)		-	0.58	1	0.61 – 2.20	1.04	4

[1]The California detection limit for purposes of reporting (DLR) for iron is 0.1 mg/L; [2]The DLR for manganese is 0.02 mg/L

Table 3 Raw water quality results for the Dalton 02 well (2017-2018)

Parameter	Goal	GSWC Sampling (2017)			Corona Sampling (2018)		
		Range	Average	Count	Range	Average	Count
Alkalinity (mg/L)		-	180	1	180	180	4
Ammonia (mg-N/L)		-	-	-	0.41 - 0.43	0.42	4
Bromide (µg/L)		-	110	1	100	100	4
Color (CU)	< 5	-	1.5	1	ND	ND	4
Dissolved Oxygen (mg/L)	8 - 10	-	-	-	0.12 - 0.28	0.22	4
Total Iron (mg/L)	< 0.1[1]	-	0.050	1	0.026 - 0.029	0.027	4
Total Manganese (mg/L)	< 0.02[2]	-	0.010	1	0.015 - 0 .016	0.016	4
pH		7.8 - 8.2	8.0	10	8.1 - 8.4	8.3	4
Odor (TON)	≤ 2	-	1	1	0 - 1	0	4
TOC (mg/L)		-	0.5	1	0.49 - 1.90	0.89	4

[1]The California detection limit for purposes of reporting (DLR) for iron is 0.1 mg/L; [2]The DLR for manganese is 0.02 mg/L

Existing Treatment Processes

The Dalton 01 and 02 wells are currently treated separately at the Dalton Wellsite. Treatment for the Dalton 01 well consists of natural chloramination, fluoride addition and sand separation. Sodium hypochlorite is injected at the Dalton 01 well head at a dose of 2.2 to 2.5 mg/L to form chloramines with the well's background ammonia for disinfection, followed by sodium fluoride addition to obtain a 0.7 mg/L residual prior to entering the distribution system. Treatment for the Dalton 02 well consists of breakpoint chlorination, fluoride addition, contact time and ammonia addition for chloramination. Chlorine is injected at the Dalton 02 well head to obtain a 2.75 to 3.0 mg/L residual, followed by sodium fluoride to obtain a 0.7 mg/L residual. The water then passes through two chemical contact tanks and is injected with ammonia for chloramine formation at the tank exit. A schematic of this treatment process is shown in Figure 2, while a plan view of the Dalton Wellsite is shown in Figure 3.

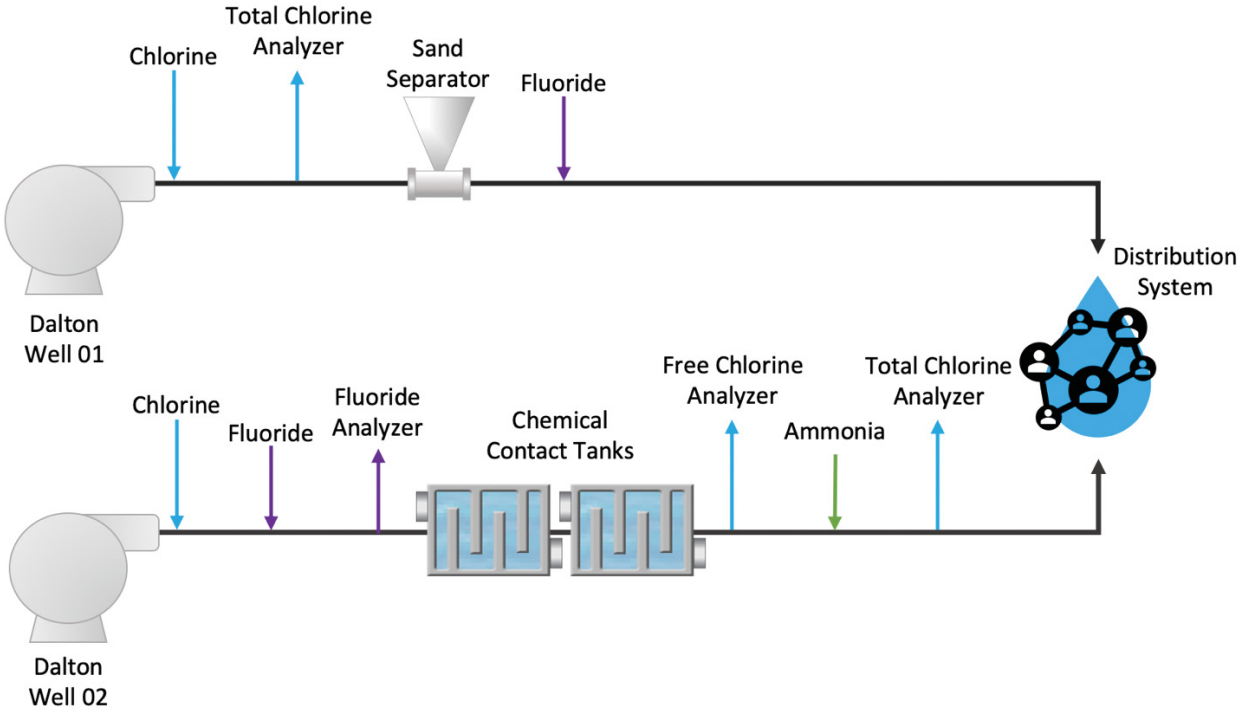
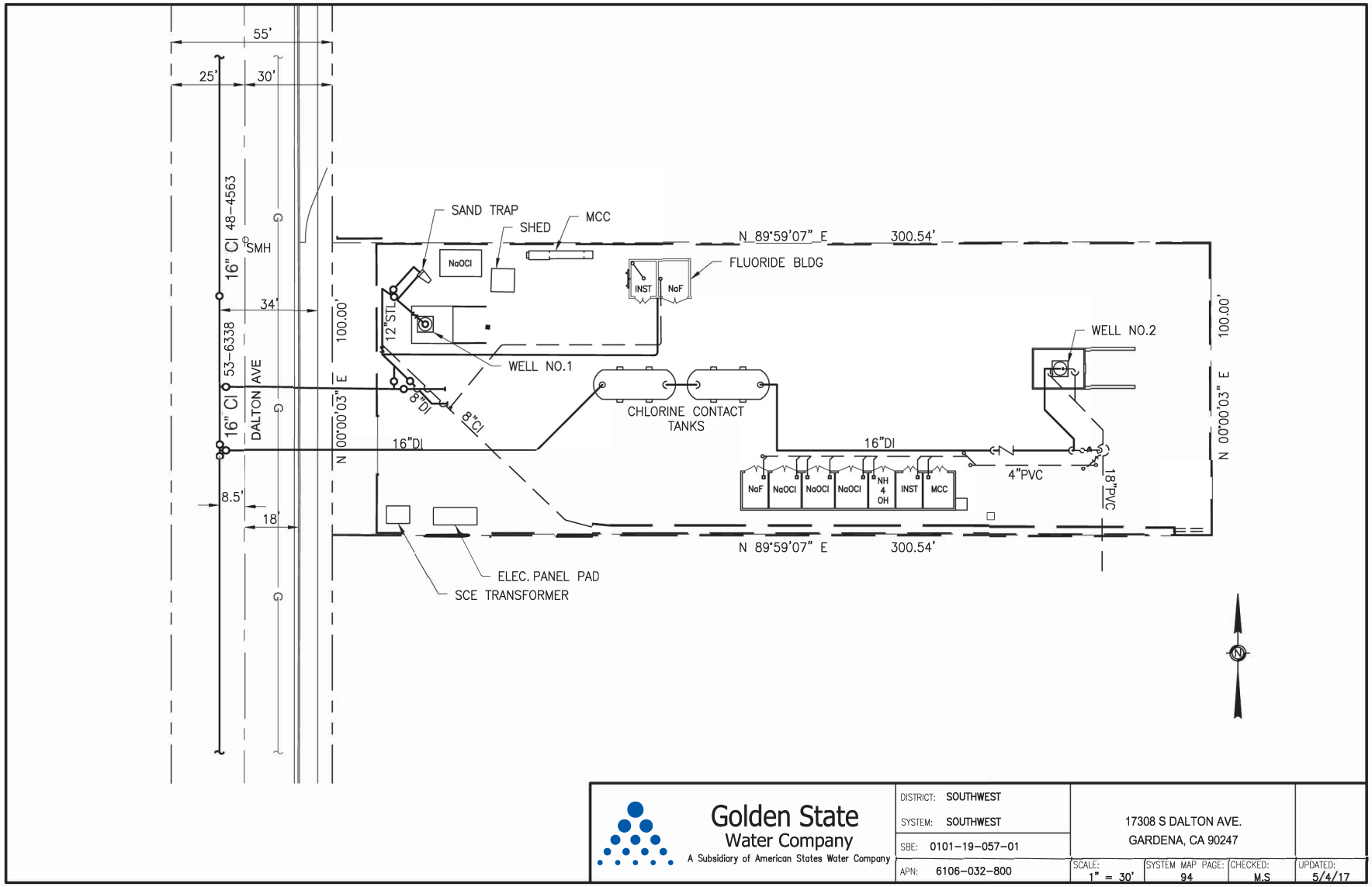


Figure 2 Existing Dalton Wellsite process flow diagram

Figure 3 Dalton Wellsite plan view (2017)



Recommended Treatment Processes

The recommended treatment process at the Dalton Wellsite, presented in Figure 4, consists of oxygen augmentation, breakpoint chlorination, filtration and chloramine formation, and was informed by water quality reviews and bench scale studies. It should be noted that at the current raw water ammonia concentrations, it would be feasible to manage ammonia without breakpoint chlorination by instead forming chloramine with the raw water ammonia. Furthermore, raw water manganese and iron concentrations are both below their respective detection limits for reporting and could enter the distribution system without treatment. These details were discussed with GSWC, who chose to proceed with the following process treatment as it requires no further full-scale performance validation.

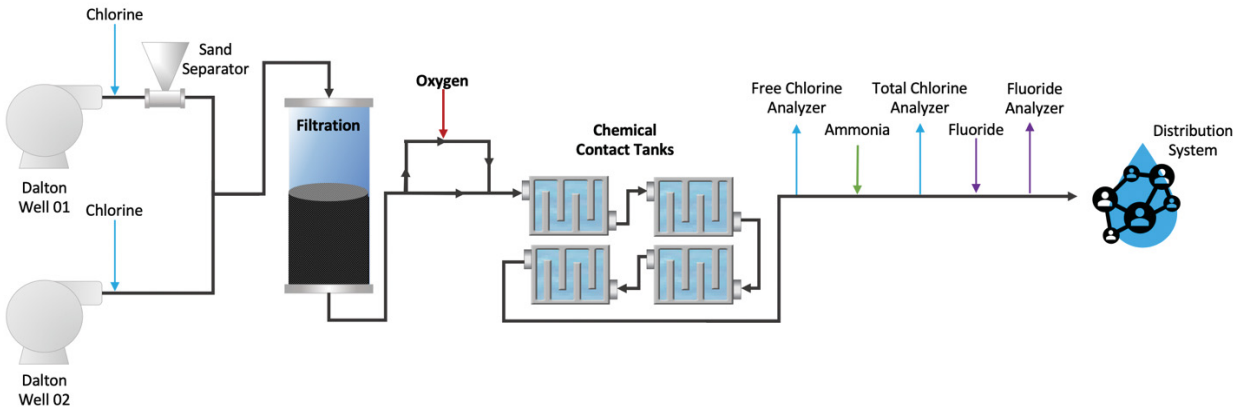
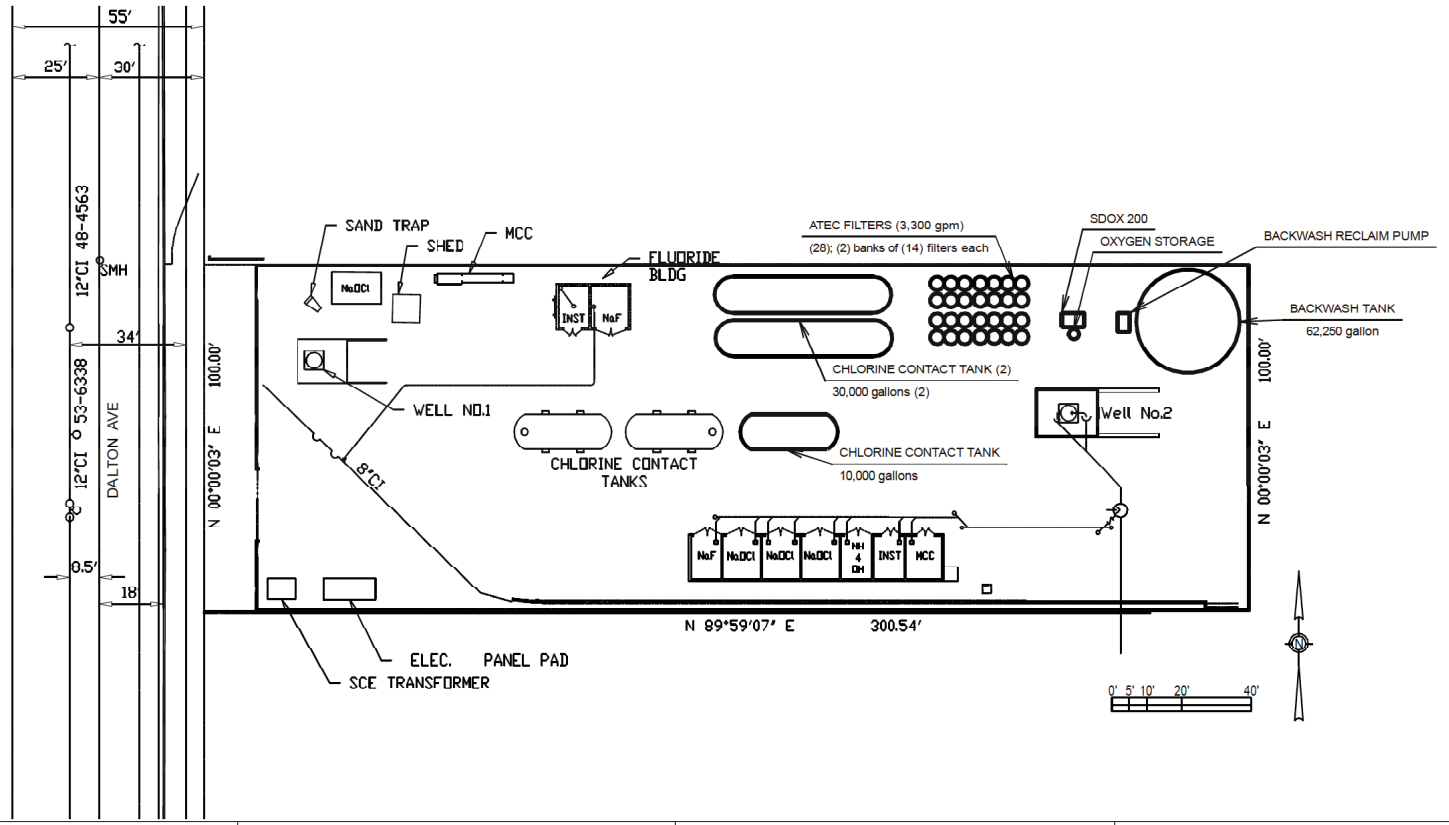


*Figure 4 Proposed Dalton Wellsite process flow diagram; new processes are indicated in **bold** font*

Chlorine will be injected at the individual well heads to achieve breakpoint chlorination, continuously regenerate the filters' pyrolusite-based media and form chloramines for disinfection. Following chlorination, flow from Dalton 01 will pass through a sand separator prior to combining with Dalton 02. Dissolved oxygen in the combined flow will then enter filter pressure vessels that will contain a pyrolusite-based filter media (ATEC System Associates) to remove manganese and iron to below detection.

Filter effluent DO will be augmented to 8-10 mg/L by a side stream process that will pull water to a new BlueInGreen SDOX-200® system and reinject the oxygenated water into the main process flow. Following oxygen augmentation, additional contact tanks will be installed to supplement the existing tanks to ensure complete breakpoint chlorination is achieved prior to the. A downstream free chlorine analyzer will be used to properly dose ammonia to the GSWC's target chlorine to ammonia ratio. The existing total chlorine analyzer, fluoride injection, and fluoride analyzer will remain upstream of the distribution system point of entry.

A conceptual equipment layout for the Dalton Wellsite is presented in Figure 5 and shows the potential locations for the new equipment. The purpose of this site layout is to demonstrate how equipment could be arranged on the wellsite. It should be noted that there could be considerable changes to this layout during the design phase; therefore, a site layout incorporating yard-piping layouts was not included.



CORONA ENVIRONMENTAL CONSULTING	GOLDEN STATE WATER COMPANY DALTON WELLSITE 3,300 GPM	FIGURE 5. CONCEPTUAL BALLONA WELLSITE EQUIPMENT LAYOUT (NOT FOR CONSTRUCTION)	GOLDEN STATE WATER COMPANY DALTON BASIS OF DESIGN GARDENA, CA

CORONA ENVIRONMENTAL CONSULTING

Recommended Improvements

Preliminary Hydraulic Assessment

Prior to installing the new treatment processes, a complete hydraulic analysis should be conducted to determine the impact of the DO augmentation and filtration systems on headloss in the system. Based on manufacturer literature, the operating pressure loss though the filtration system at flow rates s below 15 gpm/sq.ft. is less than 3 psig. The system normally overrides the time setting on the backwash controller when the pressure differential exceeds 5 psig.

Dissolved Oxygen Augmentation

Dissolved oxygen will be augmented at the Dalton Wellsite to achieve a DO concentration between 8 and 10 mg/L. DO will be increased without breaking head and will be designed around the functionality of a BlueInGreen SDOX-200® system. This system dissolves liquid oxygen into a pressurized side-stream of process water to achieve a supersaturated DO solution. The SDOX® system is skid-mounted and includes a pump, VFD, pressure vessel, mixing apparatus, piping, and all of the required instrumentation and controls, a dissolved oxygen analyzer can be added by BlueInGreen if requested. The liquid oxygen that will be used to make the concentrated side-stream will be supplied by Airgas and will be stored in a 3,000 L storage tank that will be leased from Airgas. A summary of the SDOX® system's details are presented in Table 4.

Table 4 Liquid oxygen system details

Vendor	BlueInGreen
Model	SDOX-200®
Oxygen Feed	Liquid Oxygen
Facility Peak Flow Rate (gpm)	< 5000
Starting Dissolved Oxygen (mg/L)	0.5
Final Dissolved Oxygen (mg/L)	10
Maximum Oxygen Required (lbs/day)	Up to 700
Maximum Water Temperature (°C)	30
Injection Point Pressure (psig)	90
VFD Pump Size (hp)	4.0 – 5.0
Electrical Requirements	480V, 3 PH, 60 Hz
Side Stream (inlet/outlet) Connection (in)	2
Material	Stainless Steel
LOX generation/injection system dimensions	L=8 ft, W= 6.5 ft, H=7.33 ft
LOX storage tank volume (L)	2,707
Storage tank dimensions	D=4.92 ft, H=9.74 ft
Controls	PLC
Analyzers	Dissolved Oxygen Probe

Filtration

Manganese and iron will be removed by an *ATEC Iron and Manganese Removal System* to concentrations below 0.002 mg/L and 0.02 mg/L, respectively. ATEC systems are in-line, pressure filters that utilize AS-741M Filter Media, a pyrolusite based manganese dioxide, for iron and manganese removal through adsorption. As stated by ATEC, the AS-741M Filter Media will require a free chlorine residual of 0.5 to 1.0 mg/L for continuous media regeneration, which will be achieved by chlorination at the well head. At the combined design capacity flow rate of 3,300 gpm, two (2) banks of fourteen (14) filter vessels will be required at a loading rate of 10 gpm/sq.ft. during normal operations, in addition to a 62,250-gallon backwash tank. A summary of the *ATEC Iron and Manganese Removal System's* details are presented in Table 5.

Table 5 Preliminary Filtration system details

Vendor	ATEC
Model	ATEC Iron and Manganese Removal System
Filter Media	AS-741M Filter Media (manganese dioxide)
Filter Media Specific Gravity	3.7
Filter Media Depth (in)	48
Loading Rate Range (gpm/sq ft)	7 – 16
Design Loading Rate (gpm/sq ft)	By Vendor
Number of Filters	28
Vessel Configuration	2 banks of 14 filters
Total Filter System Dimensions (ft)	H=10 ft, W=20 ft, L=30 ft
Sideshell (in)	60
Material	Carbon Steel
Backwash Loading Rate (gpm/sq ft)	28
Backwash Frequency (hours)	12 – 24
Backwash Headloss Setpoint (psig)	5
Backwash Tank Dimensions[1]	D=23.75 ft, H=12 ft
Backwash Tank Volume (gallons)[1]	62,250

[1]*Backwash tank volume and dimensions should be confirmed with equipment manufacturer*

Breakpoint Chlorination

The results of the bench-scale testing completed at the Dalton Wellsite indicates that a 20-minute contact time is required for each well to achieve breakpoint chlorination. Two existing 12,500-gallon chlorine tanks have been retro-fitted to achieve a baffle-factor of 0.30, determined by a tracer test completed by GSWC on February 13, 2020. At the maximum flow rate of 3,300 gpm, these two tanks provide 2.3 minutes of contact time, while the ATEC filters provide an additional 3.0 minutes of contact time (Table 6). ATEC filter contact time was calculated based on Water Works Engineers' *GSWC 3 Wellsites Improvements* spreadsheet (1/31/2019) using Dalton Wellsite specifications. The remaining 14.8 minutes of contact time will be provided by new baffled pressure vessels with baffling factors of 0.7. The required volume of the pressurized vessels is 70,000 gallons.

The optimum chlorine doses for breakpoint chlorination were also evaluated during bench scale testing with results showing chlorine to ammonia ratios of 13.5-15.5 and 14.5-15.5 being the optimal ranges for Dalton 01 and 02, respectively. Chlorine will continue to be injected separately at each well head, prior to combining the flow.

Table 6 Breakpoint chlorination contact time calculations

Contact Reactor	Peak Flow Rate (gpm)	Baffling Factor	Volume (gallons)	Contact Time (min)
ATEC Filter Vessels (28)	3,300[1]	0.7	15,456	2.98
Existing Chlorine Contact Tanks (2)		0.3	25,000	2.27
New Highland Tank Vessels		0.7	70,000	14.75

[1]ATEC filter contact times were calculated assuming a backwash recirculation volume of 330 gpm

Chemical Addition

Chemical metering pumps will individually dose 12.5% sodium hypochlorite at the optimum breakpoint chlorination doses at each well head. The existing ammonium hydroxide metering pump will continue to dose 19.9% ammonium hydroxide downstream of the free chlorine analyzer for chloramine formation, as shown in the recommended process flow diagram in Figure 4. The existing fluoride injection system will continue to be used with no required modifications. The chemical feed rates of the ammonia and chlorine metering pumps are provided in Table 7, with additional chemical details provided in Appendix B.

Table 7 Sodium hypochlorite and ammonium hydroxide injection details

Location	Chemical	Current Feed Pump Capacity (gph)	Raw Water Ammonia (mg-N/L)[1]	Chlorine to Ammonia Target	Dose Range (mg/L)	Chemical Feed Rate Range (gph)
Dalton 01	12.5 % Sodium Hypochlorite	1.9	0.56	13.5 – 15.5	7.6 – 8.7	2.9 – 3.3
Dalton 02	12.5 % Sodium Hypochlorite	11.1	0.47	14.5 – 17.5	6.8 – 8.2	8.2 – 9.8
Combined Flow	19.9 % Ammonium Hydroxide	5.05	NA	4.7 – 5.0	0.5 – 0.73[3]	0.5 – 0.7

[1]Raw water ammonia concentration measured during the 09/10/18 bench scale testing

The sodium hypochlorite doses shown in Table 7 were calculated based on the optimum chlorine to ammonia ratio for breakpoint chlorination and the raw water ammonia concentration measured during the bench-scale testing. The minimum and maximum doses for ammonium hydroxide account for both the target range for free chlorine (2.5 – 3.5 mg/L), as well as target range for the chlorine to ammonia ratio (4.7 – 5.0). At the Dalton 01 well's design capacity flow rate and anticipated doses, the current hypochlorite feed pump capacity is insufficient and will require a replacement. The existing Dalton 02 hypochlorite feed pump and the ammonium hydroxide feed pump capacities are sufficient and will not require upgrades. The corresponding chemical storage requirements at the Dalton Wellsite are summarized in Table 8.

Table 8 Chemical storage requirements at the Dalton Wellsite

	Dalton 01	Dalton 02
Permitted Flow (gpm)	800	2500
Existing Sodium Hypochlorite Storage Capacity (gallons)	550	1500
Anticipated Daily Sodium Hypochlorite Consumption[1] (gal/day)	70 – 80	196 – 236
Anticipated Sodium Hypochlorite Delivery Frequency[1] (days)	7 – 8	6 – 8
Additional Sodium Hypochlorite Storage	None	None
Existing Ammonium Hydroxide Storage Capacity (gallons)	240	
Anticipated Daily Ammonium Hydroxide Consumption[2] (gal/day)	12 – 18	
Anticipated Ammonium Hydroxide Delivery Frequency[2] (days)	13 – 20	
Additional Ammonium Hydroxide Storage	None	

During the design phase of this project, the design engineer should verify with GSWC staff that the required chemical delivery frequencies are feasible. If they are not, the chemical storage facilities should be increased either by upgrading the storage tank or by adding an additional bay for chemical storage.

Analyzers

The existing free chlorine analyzer will be relocated to measure chlorine downstream of the filters and will be used to properly dose ammonia to meet GSWC's chlorine to ammonia ratio goals. The second chlorine analyzer and the fluoride analyzer will remain upstream of the distribution system point of entry and will continue to be used to ensure water entering the distribution system determine wellsite is achieving the water quality goals. Dissolved oxygen probes will be integrated into the SDOX-200 system by BlueInGreen.

Appendix A — OMMP, Pump Curve and Details

Golden State Water Company
Operation, Maintenance, and Monitoring Plan
(OMMP)

Dalton Plant
(Well 1 and Well 2)

Region	II	District:	Southwest
System #	1910155	Address	17308 Dalton Ave
City	Gardena	Zip Code	90247
System Map page #	94(old map) 219 (new map)	TG Map page #	734J7

Plant Facilities

Wells

Name	**Well #1** 1910155-011		
DHS Status (active/stand-by/inactive)	Active	Company Status (on/off-line)	On-line
Design Capacity (gpm)	800	Year Drilled	1948
Diameter (in)	16	Depth (ft)	746
Perforations	544-555, 581-662		
Sanitary seal (ft)	None	Column setting (ft, bgs)	204
Gravel Port (yes/no)	Yes	Air Line Depth (ft)	191
Pump (make)	Hydroflo	Motor (make)	US
Pump/motor Lubrication	Water	Motor HP	100
PRV Setting	N/A		
ON/OFF Control by (*Pressure, Time*)			
On – 24Hr	Time	Off	Time

(If more than one well, copies the table)

Name	**Well #2** 1910155-073		
DHS Status (active/stand-by/inactive)	Active	Company Status (on/off-line)	On-line
Design Capacity (gpm)	2500	Year Drilled	2013
Diameter (in)	16	Depth (ft)	790
Perforations	530-600, 630-770		
Sanitary seal (ft)	50 ft.	Column setting (ft, bgs)	210
Gravel Port (yes/no)	Yes	Air Line Depth (ft)	200
Pump (make)	Goulds	Motor (make)	US
Pump/motor Lubrication	Water	Motor HP	350
PRV Setting	N/A		
ON/OFF Control by (*Pressure, VFD Control*)			
On – 24Hr	Time	Off	Time

MWD Connection – N/A

Name			
Designed Capacity		DHS Source Code	
PRV Setting			
ON/OFF Control by (*Pressure, Reservoir Level, Time*)			
On		Off	

Reservoir – N/A

(If applicable)

Reservoir Dimensions	
Storage capacity	
Available capacity	
Base Elevation	
Water Levels	
Overflow	
High	
Low	
Discharge pipe	
Drain	
Altitude Valve or PRV Setting (if applicable)	

Booster Pump – N/A

(If applicable) *BOOSTERS ARE OFF.*

Booster pumps	HP	Design Capacity (gpm @ head)	PRV Size & Setting	Mercoid Setting

Chemical Storage and Feed – Well 1

Sodium Hypochlorite	
Storage Capacity	500 Gallons.
Secondary Containment Capacity	550 gal
Chemical Feed Pump (brand and model)	Prominent, Gala
Chemical Feed Pump Capacity	1.9 G.P.H.

Sodium Fluoride	
Storage Capacity	92 Gal (combined)
Secondary Containment Capacity	103 Gal
Chemical Feed Pump (brand and model)	Prominent Delta
Chemical Feed Pump Capacity	5.05 gph

Chemical Storage and Feed – Well 2

Sodium Hypochlorite	
Storage Capacity	1500 Gallons.
Secondary Containment Capacity	1650 gal
Chemical Feed Pump (brand and model)	Prominent, Sigma
Chemical Feed Pump Capacity	11.1 G.P.H.

Well 2

Aqua Ammonia	
Storage Capacity	240 Gallons
Secondary Containment Capacity	275
Chemical Feed Pump (brand and model)	Prominent Delta
Chemical Feed Pump Capacity	5.05 GPH

Well 2

Sodium Fluoride	
Storage Capacity	92 Gal (combined)
Secondary Containment Capacity	103 Gal
Chemical Feed Pump (brand and model)	Prominent Delta
Chemical Feed Pump Capacity	5.05 gph

Polyphosphate N/A	
Storage Capacity	
Secondary Containment Capacity	
Chemical Feed Pump (brand and model)	
Chemical Feed Pump Capacity	

Other Facilities

Item	Description
SCADA	Touch Screen onsite
On-line Monitoring	Free Chlorine, Total Chlorine, Total Fluoride

Plant Operations

(Briefly describe plant operations)

The Dalton Plant has two wells, Dalton Well #1 and Well #2.

Well 1 Operation:

- Using a "Hand/Off/Auto (HOA) switch and the SCADA system, the well is started by an operator.
- Water from this well is pumped through a "Sand Separator" and then directly to the system at approximately 800gpm. The speed of the motor does not vary.
- The raw water from well #1 contains back ground ammonia. Sodium hypochlorite is added at the well head at a 2.2ppm to 2.5ppm dose and combines with the background ammonia to form chloramines which is used for disinfection.
- A total chlorine analyzer monitor's the amount of chlorine added to the water. The target ratio of chlorine to ammonia is 4.7 to 1 (+/-0.3).
- Sodium Fluoride is added after the well head to maintain a residual of 0.70ppm.

Well 2 Operation:

- Water from Well #2 is pumped directly to the system after it goes through two chemical contact tanks which are designed to give 10 minutes of contact time for a free chlorine residual (see site piping layout). The well has a maximum capacity of 2500gpm.
- Using a "Hand/Off/Auto (HOA) switch and the SCADA system, the Variable Frequency Drive (VFD) well motor will start automatically if it is within the proper "Start Pressure" range (85-90psi)
- Once started, well water will dump to waste through an automatic control valve (CLA-VAL) at 500gpm pump-to-waste. Pump-to-waste is to ensure clarity of the water before it enters the system.
- The CLA-VAL will close after a 5-minute timer, and the well motor VFD will "Ramp-up" to the operating pressure set point of 96psi and water will flow through a meter to the contact chambers.
- Chlorine is added at the well head at a residual of 2.75ppm to 3.0ppm. A "Free chlorine" analyzer monitor's the free chlorine residual.
- Sodium Fluoride is added just downstream of the meter at a residual of 0.70ppm. A Fluoride analyzer monitor's the residual.
- Ammonia is added to the free chlorine residual at the end of the contact chambers at a chlorine to ammonia ratio of 4.7 to 1 (+/-0.3)
- A "Total Chlorine" analyzer monitors the combined chlorine and ammonia (Chloramines) in the water as it leaves the plant.

Maintenance Schedule – Well 1 & 2

Equipment	Maintenance Frequency
Wells	As needed
Pump and Motor	Lubrication every six months and test annually.
Chemical storage tank	Daily inspection of containment Annual cleaning
Chemical feed pump	Weekly
Chemical feed line	Weekly
Chemical injection point	Weekly cleaning

Monitoring Schedule

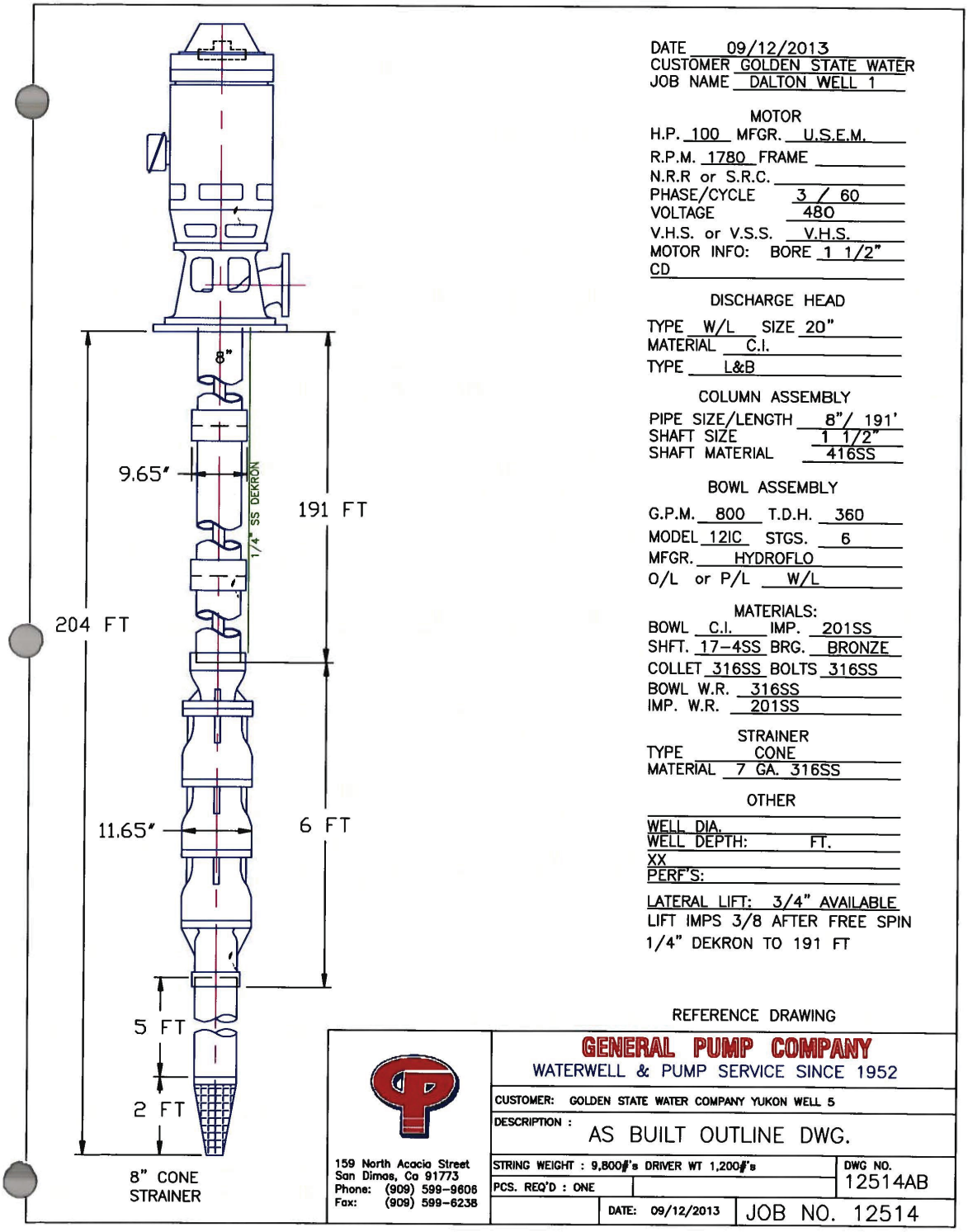
Well 1

Parameter	Monitoring Point	Frequency	Control Value/Range
Static level	Wellhead	Weekly	Record level
Pumping level	Wellhead	Weekly	Record level
Sodium hypochlorite	Storage Tank	Daily	Record usage
Chlorine Residual	Sample pt. down stream of meter	Daily or online (if applicable)	2.2 – 2.6 mg/L total 4.7:1 w/ natural ammonia
Ammonia dose	N/A		

Well 2

Parameter	Monitoring Point	Frequency	Control Value/Range
Static level	Wellhead	Weekly	Record level
Pumping level	Wellhead	Weekly	Record level
Sodium hypochlorite	Storage Tank	Daily	Record usage
Chlorine Residual	Sample pt. down stream of meter	Daily and online	2.75 – 3.0 mg/L total
Ammonia dose	4.7:1 ratio	Daily	

Well 1, Pump, Motor and Equipment



DATE 09/12/2013
CUSTOMER GOLDEN STATE WATER
JOB NAME DALTON WELL 1

MOTOR
H.P. 100 MFGR. U.S.E.M.
R.P.M. 1780 FRAME
N.R.R or S.R.C.
PHASE/CYCLE 3 / 60
VOLTAGE 480
V.H.S. or V.S.S. V.H.S.
MOTOR INFO: BORE 1 1/2"
CD

DISCHARGE HEAD
TYPE W/L SIZE 20"
MATERIAL C.I.
TYPE L&B

COLUMN ASSEMBLY
PIPE SIZE/LENGTH 8"/ 191'
SHAFT SIZE 1 1/2"
SHAFT MATERIAL 416SS

BOWL ASSEMBLY
G.P.M. 800 T.D.H. 360
MODEL 12IC STGS. 6
MFGR. HYDROFLO
O/L or P/L W/L

MATERIALS:
BOWL C.I. IMP. 201SS
SHFT. 17-4SS BRG. BRONZE
COLLET 316SS BOLTS 316SS
BOWL W.R. 316SS
IMP. W.R. 201SS

STRAINER
TYPE CONE
MATERIAL 7 GA. 316SS

OTHER
WELL DIA.
WELL DEPTH: FT.
XX
PERF'S:
LATERAL LIFT: 3/4" AVAILABLE
LIFT IMPS 3/8 AFTER FREE SPIN
1/4" DEKRON TO 191 FT

REFERENCE DRAWING

159 North Acacia Street
San Dimas, Ca 91773
Phone: (909) 599-9608
Fax: (909) 599-6238

GENERAL PUMP COMPANY
WATERWELL & PUMP SERVICE SINCE 1952

CUSTOMER: GOLDEN STATE WATER COMPANY YUKON WELL 5
DESCRIPTION : AS BUILT OUTLINE DWG.
STRING WEIGHT : 9,800#'s DRIVER WT 1,200#'s
PCS. REQ'D : ONE
DWG NO. 12514AB
DATE: 09/12/2013
JOB NO. 12514

Christensen

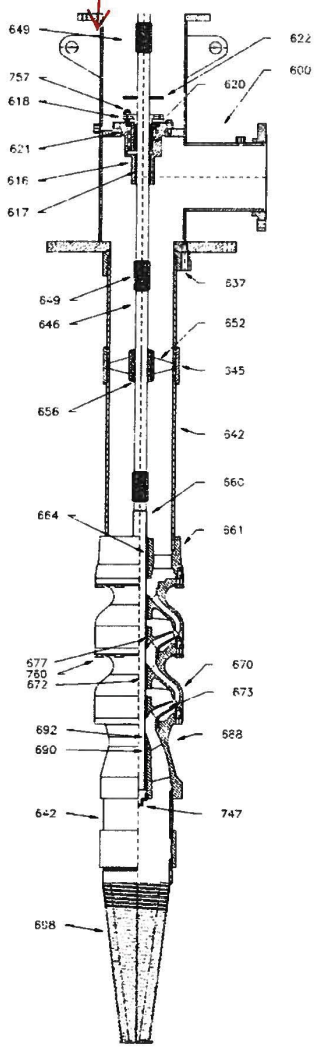
ESP Turbine Quotation System 9.0.0.24

Sectional Drawing

Customer	: LAYNE CHRISTENSEN/FONTANA	Quote number	: 173378
Customer reference	: Golden State Water	Item description	: 11CLC
Item number	: 001	Stages	: 7
Service	: Dalton Well	Speed	: 1,770 rpm
Quantity of pumps	: 1	Date last saved	: 20 May 2011 11:25 AM

Client's motor is actually an old style G.E. 100 hp motor

Head is actually cast iron



Discharge Head Assembly

ITEM	NAME	CODE	MATERIAL	ASTM
600	Head- Discharge	9645	Carbon Steel Fab	A53
604	Adjusting Nut	2130	Brass C36000	B16M-00
608	Headshaft	2227	SST 416	A582M-95b
616	Housing	1003	Cast Iron CL30	A48-94ae1
617	Housing bearing	1109	Federalloy Bismuth Bronze	B584-00
618	Split Gland	1203	SST 316	A744M-00
620	Packing	5026	Graphite Packing	ML402-99
621	O-Ring	5302	Nitrile Buna N	D4322-96
637	Top Column Flange	1003	Cast Iron CL30	A48-94ae1
639	Column Lock Ring	1018	Cast Iron CL30	A48-94ae1
649	Lineshaft Coupling	2265	416 SS	A582M-95b
757	Screw- Gland Adjusting	2229	SST 316	A276-00a
779	Gasket- Housing	5136	Acrylic/Nitrile	5136 REV 4

Column And Lineshaft Assembly

ITEM	NAME	CODE	MATERIAL	ASTM
642	Column Pipe	6501	Black Pipe	A 53-98
645	COLUMN FASTENER	6501	Black Pipe SCH 40	A 53-98
646	Lineshaft	2227	416 SS	A582M-95b
649	Lineshaft Coupling	2265	416 SS	A582M-95b
652	Retainer- Bearing	1102	Silicon Bronze C87600	B584-00
656	Lineshaft Bearing	5121	Rubber EPDM	D3568-98

Bowl Assembly

ITEM	NAME	CODE	MATERIAL	ASTM
660	Bowl Shaft	2227	416 SS	A582M-95b
661	Bowl- Discharge	1003	Cast Iron CL30	A48-94ae1
664	Bearing- Disc Bowl	1109	Federalloy Bismuth Bronze	B584-00
670	Bowl - Intermediate	6911	Cast Iron 30 Lined	A48-94e1
672	Bearing- Int. Bowl	1109	Federalloy Bismuth Bronze	B584-00
673	IMPELLER	1102	Silicon Bronze	B584-00
677	Collet	2227	SST 416	A582M-95b
688	Bowl/Bell- Suction	1003	Cast Iron CL30	A48-94ae1
690	Bearing- Suction	1109	Federalloy Bismuth Bronze	B584-00
692	Sandcollar	1205	304 SST	A744M-00
698	Strainer- Suction	6913	SST 316 Xpnd Metal	A555-97
747	Suction Plug	1046	Malleable Iron	A197
760	CAP SCREW	2229	316 ss	A194

Layne Christensen/ Fontana · 11001 Etiwanda Ave · Fontana, CA 92337
phone: 909-390-2833 · fax: 909-390-6097 ·

Pump Data Sheet - Hydroflo Pumps USA, Inc.

Company: HYDROFLO PUMPS USA, INC.
Name: DaHon 1
Date: 3/20/2013

Powered By PUMP-FLO

Pump:

Size: 12IC (6 stage)
Type: Vertical
Synch speed: 1800 rpm
Speed: 1780 rpm
Dia: 8.835 in
Curve: 110711
Impeller: 12KL SS ENCL
Specific Speeds: Ns: ---
Nss: ---
Dimensions: Suction: 8 in
Discharge: 8 in
Vertical Turbine: Bowl size: 11.8 in
Max lateral: 0.625 in
Thrust K factor: 6 lb/ft

Pump Limits:

Temperature: 140 °F
Pressure: 345 psi g
Sphere size: 0.875 in
Power: 300 hp
Eye area: ---

Search Criteria:

Flow: 800 US gpm
Head: 360 ft

Fluid:

Water
Density: 62.3 lb/ft³
Viscosity: 0.9946 cP
Temperature: 68 °F
Vapor pressure: 0.3391 psi a
Atm pressure: 14.7 psi a
NPSHa: ---

Motor:

Standard: NEMA
Enclosure: TEFC
Size: 100 hp
Speed: 1800
Frame: 405T
Sizing criteria: Max Power on Design Curve

— Data Point —

Flow:	800 US gpm
Head:	360 ft
Eff:	84.1%
Power:	86.5 hp
NPSHr:	8.01 ft

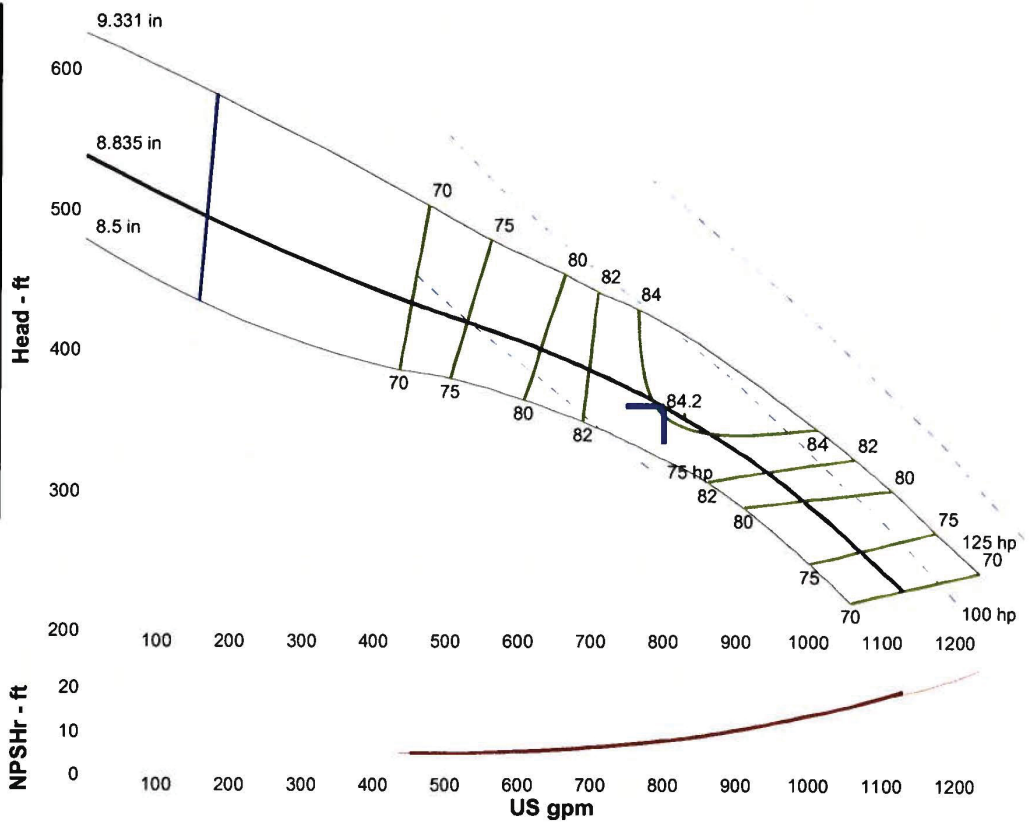
— Design Curve —

Shutoff head:	538 ft
Shutoff dP:	233 psi
Min flow:	166 US gpm

BEP: 84.2% @ 828 US gpm
NOL power: 93.4 hp @ 1128 US gpm

– Max Curve –

Max power: 108 hp @ 1234 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
960	1780	307	81.3	91.4	12.4
800	1780	360	84.1	86.5	8.01
640	1780	399	80.3	80.2	5.88
480	1780	429	71.9	72.1	5.09
320	1780	464	61.5	63.6	5.09

PUMP-FLO 10.6.1.0

Selected from catalog: Hydroflo V&S Pumps 60Hz 052412 Vers: 17

Water Well Redevelopers, Inc.

PHONE: (714) 632-7003
(800) 213-5095

2881 BLUE STAR STREET
ANAHEIM, CALIFORNIA 92806

VIDEOLOG FIELD REPORT

OWNER Golden State Water Company
401 S. San Dimas Canyon Road
San Dimas, CA 91773

WELL LOCATION North of Artesia Blvd.
on East side of Dalton Ave.
Moneta, CA

WELL NO. Dalton #1 TECHNICIAN JM UNIT NO. 1 DATE 08-16-13

WELL HISTORY

CASING 16"--0' to 686'
(Per Driller's Log)

PERFORATIONS 542' - 553', 582' - 660'
(Per Videolog (DC) 08-16-13)

DRILLED N/A BY N/A TYPE Cable Tool PERF. TYPE Horizontal Louers

PUMP: TYPE N/A COLUMN N/A BOWLS N/A DEPTH OF INTAKE N/A

WELL HISTORY NOTES: Sonar-Jet 11-20-06; Videolog (DC) 01-16-09

VIDEOLOG INFORMATION

SWL 78' TWD 666' WATER VISIBILITY Good

VIDEOLOG DC REVIDEO _____ LOG TO GP DVD TO GP/GSWC

REMARKS

SURVEY STARTED AT GRADE. CAMERA CENTERING GUIDE SET AT 14" I.D. DURING SURVEY. NO DRAG NOTED WHILE DESCENDING.

LIGHT TO MODERATE CRUSTY, PARTIALLY LIFTED FERROUS OXIDE DEPOSITS ARE VISIBLE FROM 0' TO 78' (STATIC). A LIGHT, CRUSTY/TUBERCULAR DEPOSITION CAN BE SEEN FROM 78' (STATIC) TO 666' (BOTTOM).

RUB MARKS ARE NOTED AT 246', 247', 248', 249', 250' AND 251'.

MAJORITY OF PERFORATIONS APPEAR OPEN AND SLIGHTLY OVERSIZED FROM 542' TO 553' AND A 580' TO 660'. GRAVEL CAN BE SEEN RESTING BEHIND PERFORATIONS.

OTHER THAN ABOVE, CASING, JOINTS AND PERFORATIONS APPEAR TO BE IN NORMAL CONDITION.

Originators of SONAR-JET A PATENTED WATER WELL CLEANING DEVICE

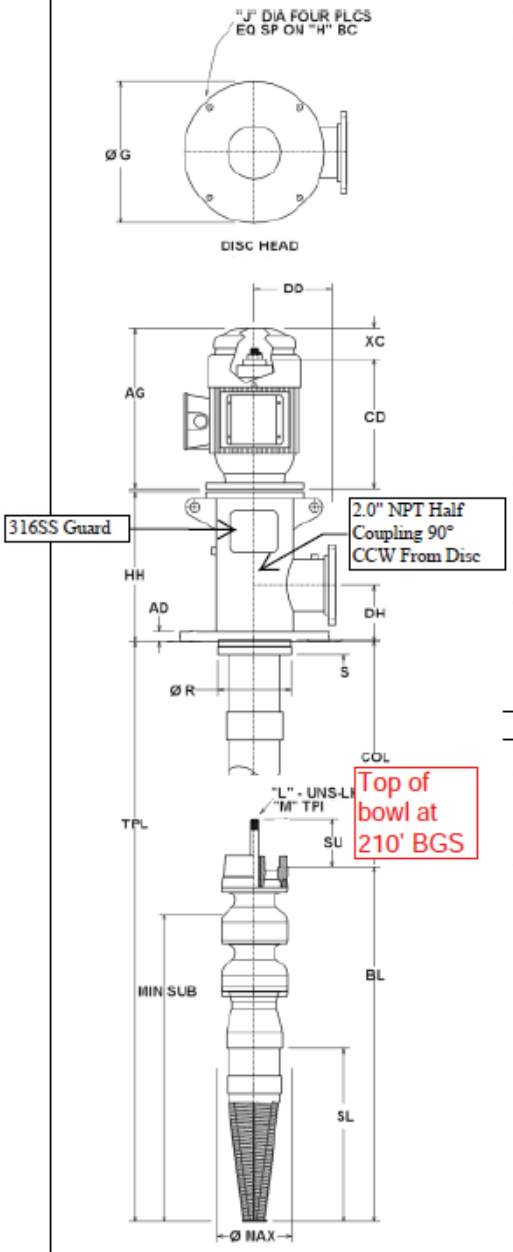
VIDEOLOG Color T.V. Inspections

Well 2, Pump, Motor and Equipment

GOULDS WATER TECHNOLOGY
a xylem brand

OUTLINE DRAWING

Quote Number: 3301-151201-041:2
Model: DWT-FFTM
Size: 14RJHC 6 Stage(s)

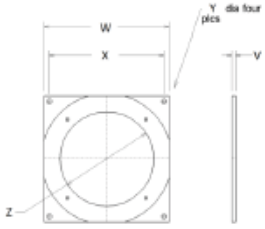


DIMENSIONS

AD	1.75	inch
AG	63.88	inch
BD	20.0	inch
BL	112.50	inch
CD	56.88	inch
COL	210	feet
DD	22.00	inch
MIN SUB	58.60	inch
DH	12.00	inch
G	32.00	inch
H	29.50	inch
HH	38.00	inch
J	1.38	inch
L	1.94	inch
M	10	tpi
SU	8.00	inch
TPL	219.38	feet
V	1.00	inch
W	32.00	inch
X	29.00	inch
XC	4.50	inch
Y	1.00	inch
Z	26.00	inch
Max Dia	13.62	inch
Discharge	150#FF 12	inch
Suction	NPT 10	inch

Weights

Total bowl	1165.00	lb
Total column	0	lb
Discharge head	961.00	lb
Driver	0.00	lb
Approx weight	2126.00	lb



PUMP DATA

No. of Units	1.00
Model:	DWT-FFTM 14RJHC
Stages:	6
Col Size:	12" [305mm]
Shaft:	1.9375 in dia
Flow:	2500.00 USGPM
Head:	384.00 ft
Driver Mfr:	USEM
Driver Type:	VHS
Rating:	350 Hp [261 kW]
Speed:	1800 RPM
Phase:	3
Frequency:	60 Hz
Voltage:	460

No.	NOTES
1	*Total Pump Length ± 1.0 inch.*
2	*Tolerance on all dimensions is .12 or ± .12 inch per 5 ft, whichever is greater.*
3	*All dimensions shown are in inches unless otherwise specified.*
4	*Drawing not to scale.*
5	*½" NPT – Gauge Conn (plugged)*
6	*Driver may be rotated at 90° intervals about vertical centerline for details refer to driver dimension drawing.*
7	*Before starting pump, impeller must be lifted 0.19 inch.*
8	*This assembly has been designed so that its natural frequency responses avoid the specific operating speeds by an adequate safety margin. The design has assumed the foundation to be rigid.*

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED

Certified by	J Ireland
Date of certification	3/28/16
Pump serial number	
Project Name	Golden State Water- Dalton Well 2
Tag	Dalton Well 2

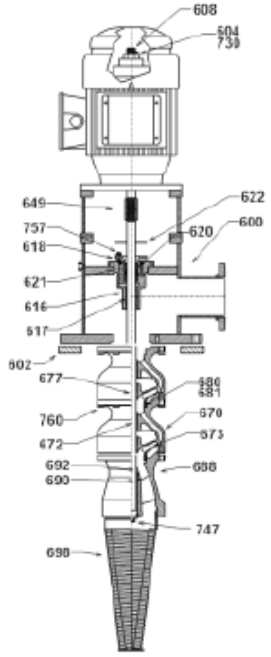
GOULDS WATER TECHNOLOGY a xylem brand

CROSS SECTIONAL

Quote Number: 3301-151201-041:2
Model: DWT-FFTM
Size: 14RJHC 6 Stage(s)

BILL OF MATERIAL

ITEM	Part Name	CODE	MATERIAL	ASTM#
Discharge Head Assembly				
600	Head – Discharge	9645	Carbon Steel Fab	A53
602	Head – Base Plate	3201	Carbon Steel	A36M-00a
604	Nut – Adjusting	2242	Carbon Steel 1018	A108-99
608	Headshaft	2227	416SS	A582M-95b
616	Housing	1003	Cast Iron CL30	A48-94-ae1
617	Bearing-Housing	1109	Bronze C90300 "G" Modified	B584-00
618	Gland-Split	1203	316SS	A744M-00
620	Packing	5026	Acrylic yarn and graphite	ML402-99
621	O-Ring	5302	Nitrile Buna N	D4322-96
622	Slinger	5121	Rubber EPDM	D3568-98
730	Key-Motor Gib	2242	Carbon Steel 1018	A108-99
757	Screw-Gland Adj	2229	SST 316	A276-00a
Bowl Assembly				
660	Bowl-Shaft	2227	416SS	A582M-95b
664	Bearing – Disc Bowl	1109	Bronze C90300 "G" Modified	B584-00
670	Bowl-Inter	6911	Cast Iron CL30 Enamel	A48-94e1
672	Bearing-Int Bowl	1109	Bronze C90300 "G" Modified	B584-00
673	Impeller	1203	316SS	A744M-00
677	Collet-Impeller	2217	416SS	A582-95b
674	Key-Impeller	N/A	None	N/A
680	Wear Ring-Bowl	1128	Bronze, AL C95400	B148-97e1
681	Wear Ring-Impeller	1128	Bronze, AL C95400	B148-97e1
688	Bowl-Suction	1003	Cast Iron CL30	A48-94e1
690	Bearing-Suction	1109	Bronze C90300 "G" Modified	B584-00
692	Sandcollar	1205	304SS	A744M-00
698	Cone Strainer	3216	316LSS	A240 TP316L
747	Plug-Pipe	1046	Malleable Iron	A197
760	Capscrew-Hex	2229	316SS	A276-00a



DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	J Ireland
Date of certification	3/28/16
Pump serial number	
Project Name	Golden State Water- Dalton Well 2
Tag	Dalton Well 2

GOULDS WATER TECHNOLOGY
a xylem brand

TURBINE SUBMITTAL

Quote Number: 3301-151201-041:2
Model: DWT-FFTM
Size: 14RJHC 6 Stage(s)

OPERATING CONDITIONS

Temp / SG	70° F / SP.GR 1.00
Fluid Type	Water
Lubrication Method	Water (Open Lineshaft)
Vapor Pressure	0.3633 psi
Viscosity	0.9695 cP
Specified Flow	2500.00 USGPM
Total Dynamic Head	384.00 ft
Pumping Level	1.000 ft
TPL	0.000 ft
Column Length	210.000 ft
Documentation	Standard pump installation and operation manual and order data

PERFORMANCE AT 1770 RPM

Bowl Efficiency	81.20 @design, 83.90 Best Efficiency
Run Out Capacity	2764.00 USGPM
Power	300.00 @design, 302.00 NOL (Hp)
Npshr	35.60 ft @design
Design Thrust	7344.00 @design (lb)
Shut off Pressure	259.00 psi

MATERIALS AND DIMENSIONS

Bowl	Cast iron with glass enamel		
Suction Bowl	Cast Iron CL30		
Bowl Wear Ring	Bronze, AL C95400		
Impeller	316SS		
Impeller Diameter	9.3750 inch		
Impeller Wear Ring	Bronze, AL C95400		
Impeller Balance	Dynamic Two-Plane Balance		
Impeller Lock Method	Taper lock	Key Material	None
Bowl Shaft	416SS, 1.9375 inch diam.		
Suction Bearing	Bronze C90300 "G" Modified		
Bowl Bearings	Bronze C90300 "G" Modified		
Rifled Drill Shaft	No		
Collets	416SS		
Strainer Type	316LSS Cone Strainer		
Tube Bearing Adapter Material	Not Included		

Discharge Head	Carbon Steel Fab
Discharge Head Style	FF
Discharge Flange	12" [305mm] (in), 150#FF
Head Shaft Coupling	416SS Threaded
Steel Sub Base	Carbon Steel
150# Disch Companion Flange	Not Included

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED

Certified by	J Ireland
Date of certification	3/28/16
Pump serial number	
Project Name	Golden State Water- Dalton Well 2
Tag:	Dalton Well 2

GOULDS WATER TECHNOLOGY a xylem brand

TURBINE SUBMITTAL

Quote Number: 3301-151201-041:2
Model: DWT-FFTM
Size: 14RJHC 6 Stage(s)

300# Disch Convenience Flange	Not Included
Head Bolting	316SS
Head Sleeve	None
Thrust Pot	Not Required
Sealing Method	Packing
Packing	Acrylic yarn and graphite
Mechanical Seal	Not Included
Sealing Features	

DRIVER INFORMATION

Motor Type	VHS - JUCEI
Motor Manufacturer	USEM
Rating	350 Hp
Efficiency Level	Premium
Motor Part Number	VHSP
Enclosure	TEFC
Phase / Frequency / Volts	3 / 60 Hz / 460
Speed	1800 RPM

TESTING

Hydrostatic:	Hydrostatic Testing (Non-Witness): Bowl, and Head @ 389-psig for 5-min
Performance:	Performance Testing (Non-Witness): Customer Motor, Bowl Assembly per HI 14.6 Grade 1E, Approval Required
Vibration:	None
NPSH:	None
Post Inspection:	None
Final Inspection:	None
Other:	Record Motor Bearing Temperatures Grade 1E

COATING

Coating Information:	Scotchkote 134; 12 mils; Bowl Assembly - OD; Head Assembly - OD and ID

ADDITIONAL FEATURES

Additional Bowl Features	
Additional Column Features	
Additional Head Features:	FF Discharge Flange 316ss Guards 2.0" Pre-Lube Connection 90° CCW From Discharge Include Thru-Thread Hanger Flange & 18Lg Column Nipple
Additional Driver Features:	
Additional Can features:	
Additional Misc features:	

WEIGHTS

Total bowl weight	1165 lbs

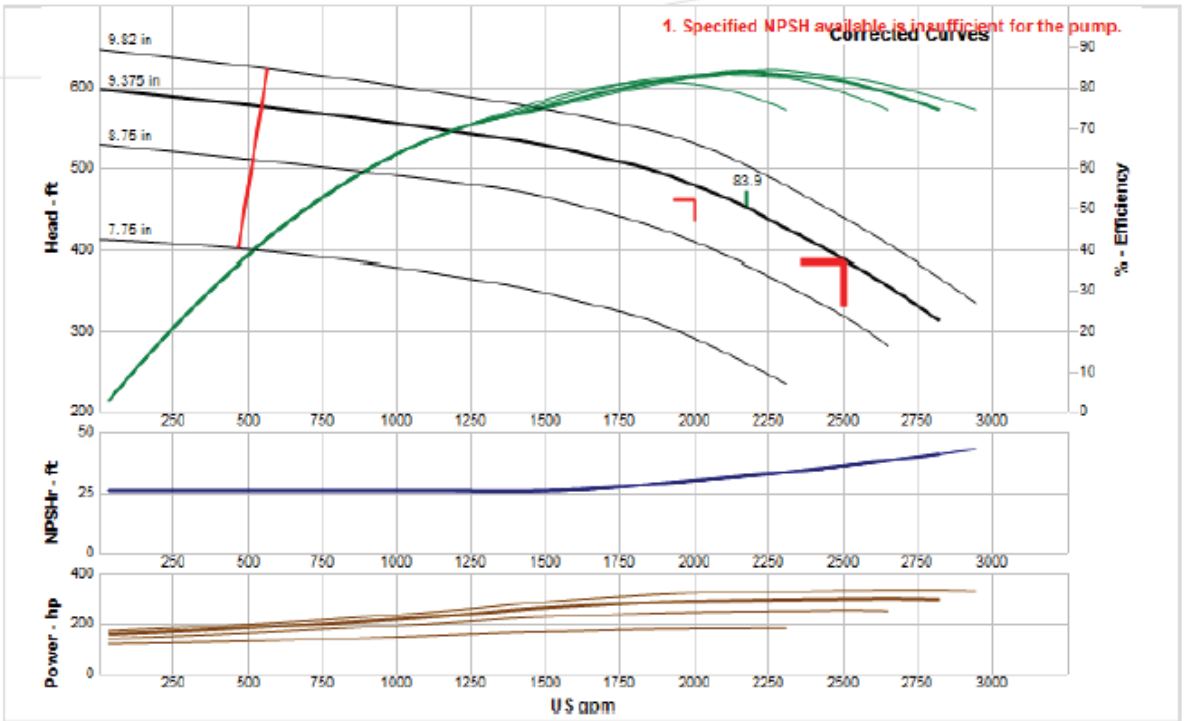
DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED

Certified by	J Ireland
Date of certification	3/28/16
Pump serial number	
Project Name	Golden State Water- Dalton Well 2
Tag:	Dalton Well 2

GOULDS WATER TECHNOLOGY
a xylem brand

PERFORMANCE CURVE

Quote Number: 3301-151201-041:2
Model: DWT-FFTM
Size: 14RJHC 6 Stage(s)



Driver Size Criteria:	Max power on design curve (NOL)	Best Efficiency:	83.90 %
Speed:	1770	Flow at BEP:	2172.00 USGPM
Impeller Trim:	9.3750 inch	Min Flow:	545.00 USGPM
Frequency:	60 Hz	Derate Factor:	0.9800
Additional Impeller Trim:	9.375 inch	NPSH Required:	35.60 ft
Impeller Maximum Trim:	9.8200 inch	Specified NPSH Avail:	34.00 ft
Specified Flow:	2500.00 USGPM	Shut-Off Head:	598.00 ft
Specified Head:	383.00 ft	Fluid Type:	Water
Head at Design:	384.00 ft	Temperature / Specifc Gravity:	70°F / 1.00
Efficiency at Design:	81.20 %	Viscosity:	0.9695 cP
Power at Design:	300.00 Hp	Allowable Sphere Size:	1.06 inch
Flow on Design Trim at Max Power:	2673 USGPM	Thrust K Factor:	13.0000 lbs/ft
Max Power on Design Curve:	302.00 Hp	Additional Thrust K Factor:	13.0000 lbs/ft
Run-Out Flow:	0.00 USGPM	Max Lateral:	1.25 inch
Run-Out Head:	0 ft		

DO NOT USE FOR CONSTRUCTION UNLESS CERTIFIED	
Certified by	J Ireland
Date of certification	3/28/16
Pump serial number	
Project Name	Golden State Water- Dalton Well 2
Tag	Dalton Well 2

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0202789

Page 1 of 2

Owner's Well Number Dalton Well #2

Date Work Began 11/13/2013 Date Work Ended 2/19/2014

Local Permit Agency LA County Environmental Health

Permit Number 893033 Permit Date 11/4/13

State Well Number/Site Number: 03S 14W 25P 0065

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation: ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method: Reverse Rotary Drilling Fluid: Bentonite

Depth from Surface	Depth to	Description
0	90	Sand
90	95	Gray Clay Sand
95	120	Fine Sand
120	130	Sand
130	135	Sand Little Gravel
135	150	Sand
150	160	Sand Little Gravel
160	165	Sand & Rocks
165	170	Sand & Clay
170	175	Sand & Green Clay
175	185	Sand Clay & Rocks
185	195	Sand Green Clay Rocks
195	200	Sand & Clay Gravel
200	215	Sand & Clay
215	230	Sand little Gravel
230	255	Sand Gravel
255	270	Sand Shale
270	295	Sand Shale & Clay
295	300	Sand
300	350	Sand Clay
350	355	Sand Gravel
355	360	Sand Clay
360	370	Sand Gravel
370	385	Sand Clay
385	395	Sand little Clay
395	430	Sand
430	435	Sand Gravel
435	450	Sand Clay
450	470	Clay
470	480	Sand

Total Depth of Boring 1200 Feet

Total Depth of Completed Well 790 Feet

Well Owner

Name Golden State Water Company

Mailing Address 2143 Convention Center Way Suite 110

City Ontario State CA Zip 91764

Well Location

Address 17308 S. Dalton Ave

City Gardena County Los Angeles

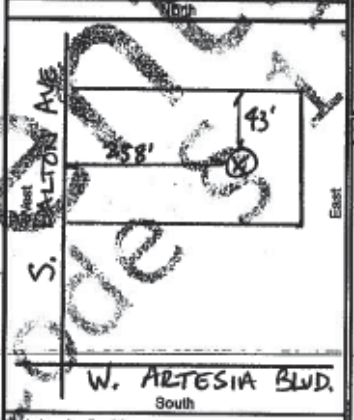
Latitude Deg. Min. Sec. Longitude Deg. Min. Sec. W

Datum Decimal Lat. Decimal Long.

APN Book 6106 Page 032 Parcel 800

Township Range Section

Location Sketch



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Type of Activity

◉ New Well
○ Modification/Repair
○ Deepen
○ Other
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Proposed Use

◉ Water Supply
☐ Domestic ☑ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water 80 (Feet below surface)

Depth to Static

Water Level 80 (Feet) Date Measured 03/01/2014

Estimated Yield * 2,000 (GPM) Test Type Constant Rate

Test Length 24.0 (Hours) Total Drawdown 21 (Feet)

*May not be representative of a well's long term yield.

Casing

Depth from Surface Feet	to Feet	Borehole Diameter (inches)	Type	Material	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size If Any (inches)
0	50	44	Conductor	Low Carbon Steel	.375	36		
0	530	32	Blank	HSLA	.375	18 3/4		
530	600	32	Perf	HSLA Ful Flo	.375	18 3/4	Louver	0.090
600	630	32	Blank	HSLA	.375	18 3/4		
630	770	32	Perf	HSLA Ful Flo	.375	18 3/4	Louver	0.090
770	790	32	Blank	HSLA	.375	18 3/4		

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	50	Cement	Conductor Seal
0	5	Fill	Sand
5	500	Cement	Annular Seal
500	800	Filter Pack	Premier 6x9
800	1,200	Fill	Backfill

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Bakersfield Well & Pump Co. (Person, Firm or Corporation)

7212 Fruitvale Ave (Address) Bakersfield (City) CA (State) 93308 (Zip)

Signed (C-67 Licensed Water Well Contractor) 3/4/2014 (Date Signed) 440537 (C-57 License Number)

DWR 188 REV. 1/2006

MAR 18 2014

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0202789

Page 2 of 2

Owner's Well Number Dalton Well #2

Date Work Began 11/13/2013 Date Work Ended 2/19/2014

Local Permit Agency LA County Environmental Health

Permit Number 893033 Permit Date 11/4/13

DWR Use Only - Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Reverse Rotary Drilling Fluid Bentonite

Depth from Surface Feet	to Feet	Description
480	485	Sand Clay
485	500	Sand Gravel Rocks
500	525	Sand Shale Clay
525	545	Sand Gravel Rocks
545	605	Sand Gravel
605	625	Sand Clay
625	645	Sand Gravel
645	655	Sand Gravel Clay
655	730	Sand Gravel
730	780	Sand
780	795	Sand Clay
795	810	Sand Shale Gravel
810	815	Sand Gravel Clay
815	855	Sand Clay
855	880	Sand Clay Shale
880	990	Sand Clay
990	1,030	Clay
1030	1,085	Sand Clay
1085	1,095	Clay
1095	1,105	Sand Clay Gravel
1105	1,135	Clay
1135	1,155	Sand Gravel
1155	1,160	Sand Gravel Clay
1160	1,170	Sand Clay
1170	1,185	Sand Gravel Clay
1185	1,200	Sand Clay

Total Depth of Boring 1200 Feet

Total Depth of Completed Well 790 Feet

Well Owner

Name Golden State Water Company

Mailing Address 2143 Convention Center Way Suite 110

City Ontario State CA. Zip 91764

Well Location

Address 17308 S. Dalton Ave

City Gardena County Los Angeles

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Decimal Lat. Decimal Long.

APN Book 6106 Page 032 Parcel 800

Township Range Section

Location Sketch

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

◉ New Well

○ Modification/Repair

○ Deepen

○ Other

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Use

◉ Water Supply

☐ Domestic ☑ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☐ Other

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name Bakersfield Well & Pump Co.
Person, Firm or Corporation

7212 Fruitvale Ave Bakersfield CA. 93308
Address City State Zip

Signed
C-57 Licensed Water Well Contractor

3/4/2014 Date Signed

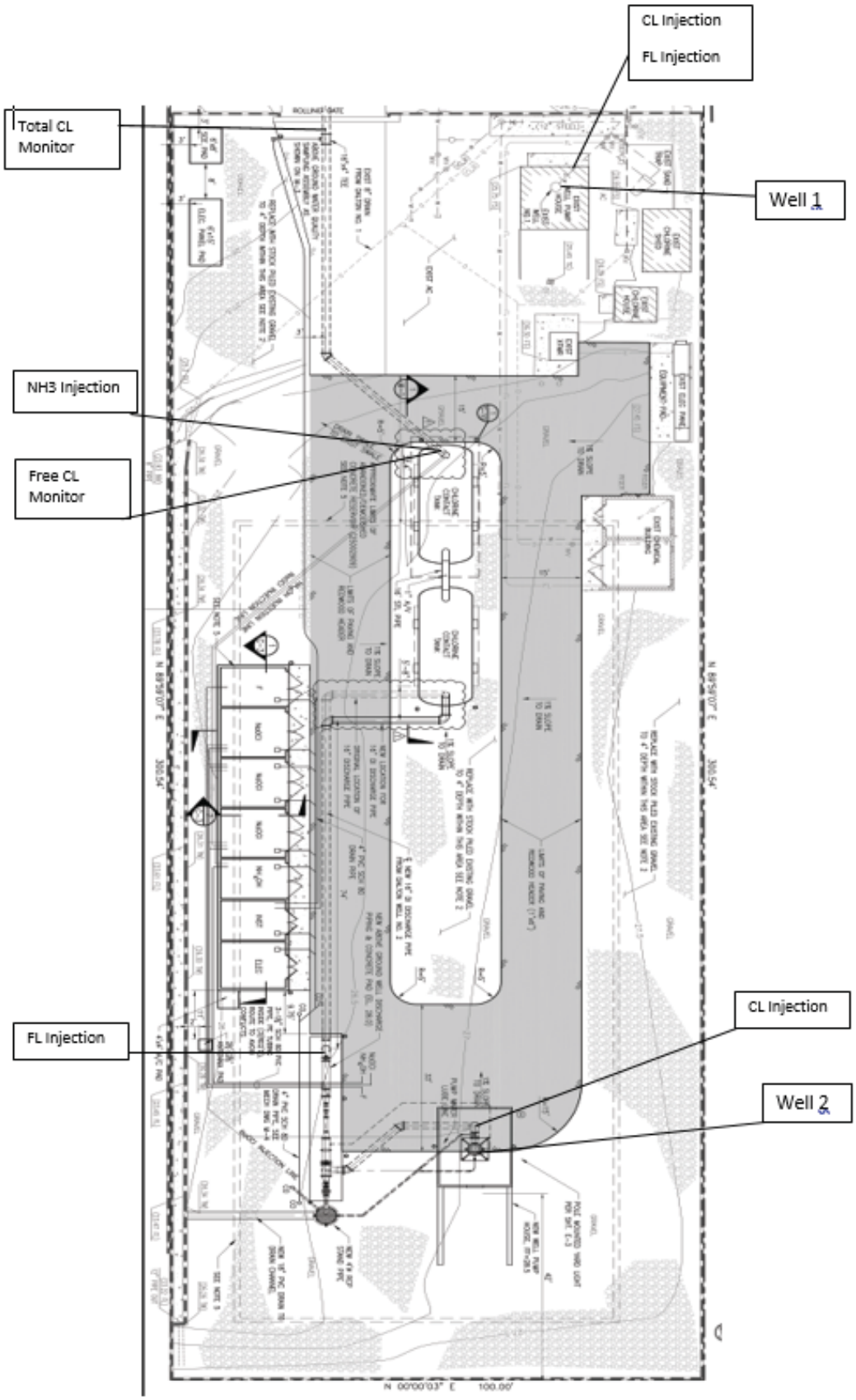
440537 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Dalton Plant Flow Diagram

(to be developed by Water Supply and Water Quality)



Appendix B — Chemical Information

Univar USA Inc Safety Data Sheet

SDS No:

Version No: 001 2015-06-25

Order No:

3075 Highland Pkwy, Ste 200, Downers Grove, IL 60515
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

MULTI-CHLOR
Safety Data Sheet (SDS No. 108)

MULTI-CHLOR

Safety Data Sheet

12.5% Sodium Hypochlorite

Emergency 24 Hour Telephone: **CHEMTREC 800.424.9300**

Corporate Headquarters: Hasa Inc.
P.O. Box 802736
Santa Clarita, CA 91355
Telephone • 661.259.5848
Fax • 661.259.1538

SECTION 1: IDENTIFICATION			
1.1	**Product Identification:**		
	1.1.1	**Product Name:**	MULTI-CHLOR
	1.1.2	**CAS #** (Chemical Abstracts Service)**:**	7681-52-9
	1.1.3	**RTECS** (Registry of Toxic Effects of Chemical Substances)**:**	NH3486300
	1.1.4	**EINECS** (European Inventory of Existing Commercial Substances)**:**	231-668-3
	1.1.5	**EC Number:**	231-668-3
	1.1.6	**Synonym:**	Bleach, Hypo, Hypochlorite, Liquid Chlorine Solution
	1.1.7	**Chemical Name:**	Sodium Hypochlorite
	1.1.8	**Chemical Formula:**	NaOCl
1.2	**Recommended Uses:**		Sanitizer of swimming pool and spa water.
1.3	**Company Identification:**		Hasa Inc. P. O. Box 802736 Santa Clarita, CA 91355
1.4	**Emergency Telephone Number:**		**CHEMTREC** 1-800-424-9300 (24 hour Emergency Telephone)
1.5	**Non-Emergency Assistance:**		661-259-5848 (8 AM – 5 PM PST / PDT)

SECTION 2: HAZARD(S) IDENTIFICATION		
HEALTH HAZARD	Skin corrosion / irritation:	Category 1
	Serious Eye damage / Eye Irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 (respiratory tract irritation)
ENVIRONMENTAL HAZARD	Hazardous to the aquatic environment, acute hazard	Category 1
PHYSICAL HAZARD	Corrosive to metals.	Category 1
SYMBOLS	  	
SIGNAL WORD	**DANGER**	
HAZARD STATEMENT	May be corrosive to metals. Causes severe skin burns and eye damage. May cause respiratory irritation. Very toxic to aquatic life.	
PRECAUTIONARY STATEMENT	**Prevention**	
	Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe mist or vapor. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Keep only in original container. Avoid release to the environment.	
	Response	
	If swallowed: Rinse mouth. Do NOT induce vomiting. If inhaled: Remove person to fresh air and keep comfortable for breathing. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Absorb spillage to prevent material damage. Collect spillage.	
	Storage and Disposal	
	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in corrosive resistant container. Dispose of container/contents in accordance with local, regional, national, international regulations as specified.	

SECTION 3: COMPOSITION INFORMATION ON INGREDIENTS				
	Ingredient	**Synonyms**	**CAS No.**	**Weight %**
3.1	Sodium Hypochlorite	Bleach	7681-52-9	12.5%
3.2	Sodium Hydroxide	Caustic Soda	1310-73-2	0.2%

SECTION 4: FIRST AID MEASURES

4.1	**IF IN EYES**	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
4.2	**IF ON SKIN OR CLOTHING**	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
4.3	**IF INHALED**	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
4.4	**IF SWALLOWED**	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage.

SECTION 5: FIRE FIGHTING MEASURES

5.1	**Flash Point:**		Not applicable.
5.2	**Flammability:**		Nonflammable and noncombustible.
5.3	**Auto-Ignition Temperature:**		Not applicable.
5.4	**Products of Combustion:**		Not pertinent.
5.5	**Fire Hazards:**		May decompose, generating irritating chlorine gas.
5.6	**Explosion Hazards:**		Not explosive.
5.7	**Fire Fighting Media and Instructions:**		
	5.7.1	**Extinguishing Media:**	Water fog. Foam. Dry chemical powder. Carbon dioxide.
	5.7.2	**Small Fires:**	Use carbon dioxide, or water spray.
	5.7.3	**Large Fires:**	Use flooding quantities of water as fog.
5.8	**Special Remarks on Fire Hazards:**		Do not use Mono Ammonium Phosphate (MAP) fire extinguishers. Such use may cause explosion with release of toxic gases.

SECTION 6: ACCIDENTAL RELEASE MEASURES		
6.1	**Small Spill:**	Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.
6.2	**Large Spill:**	Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Never return spills in original containers for re-use. For waste disposal, see Section 13 of the SDS.
6.3	**Personal Precautions, Protective Equipment & Emergency Procedures:**	Keep unnecessary personnel away. Wear appropriate personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Absorb spillage to prevent material damage. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see Section 8 of the SDS.
6.4	**Environmental Precautions:**	Do not discharge into drains, water courses or onto the ground. Environmental manager must be informed of all major releases.

SECTION 7: HANDLING AND STORAGE		
7.1	**Handling:**	• Avoid contact with skin or eyes. • Do not ingest. • Avoid inhalation of vapor or mist. • Wear protective equipment if necessary. • Mix only with water in accordance with label directions. • Mixing this product with ammonia, acids, detergents, etc or with organic materials, e.g. feces, urine, etc. will release chlorine gas, which is irritating to eyes, lungs, and mucous membranes.
7.2	**Hygiene Measures:**	• Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. • While handling this product, avoid eating, drinking or smoking.
7.3	**Storage:**	• Do not freeze. • Store in a cool, shaded outdoor area. • Inside storage should be in a cool, dry, well-ventilated area. • To maintain hypochlorite strength, do not store in direct or heated indoor areas. • Keep in original vented container. • Keep container closed when not in use. • Do not store adjacent to chemicals that may react if spillage occurs. • If closed containers become heated, vent to release decomposition products (mainly oxygen under normal decomposition).

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1	**Engineering Controls:**		Local exhaust ventilation to maintain levels below STEL (Short Term Exposure Limit) of 1 ppm as chlorine.	
8.2	**Personal Protection:**			
	8.2.1	**Eye / Face Protection:**	Wear safety glasses, goggles or face shield to prevent eye contact.	
	8.2.2	**Skin Protection:**	Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Butyl rubber, Neoprene, or Nitrile Gloves should be worn when handling this material. Wear chemical resistant clothing such as a rubber apron when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing promptly and wash before reuse. Clean protective equipment before reuse.	
	8.2.3	**Respiratory Protection:**	Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and chemical goggles. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus.	
	8.2.4	**Other Safety Equipment:**	Eye wash facility and emergency shower should be in close proximity.	
8.3	**Exposure Limits:**		**Sodium Hypochlorite**	**Chlorine***
	8.3.1	**AIHA** (American Industrial Hygiene Association) / **WEEL** (Workplace Environmental Exposure Level guides) 2010	2 mg/m^3: 15 minute. (Short-term time weighted average)	Not established
	8.3.2	**ACGIH** (American Conference of Governmental Industrial Hygienists) **TWA** (Time Weighted Average)	Not established.	0.5 ppm
	8.3.3	**ACGIH STEL** (Short Term Exposure Limit)	Not established.	1 ppm
	8.3.4	**OSHA PEL** (Permisible Exposure Limit)	Not established.	0.5 ppm
	8.3.5	**ACGIH** Ceiling	Not established.	Not established
	8.3.6	**NIOSH** (National Institute for Occupational Safety & Health) **IDLH** (Immediate Danger to Life & Health)	Not established.	10 ppm
	8.3.7	**OSHA STEL** (Short Term Exposure Limit)	Not established.	1 ppm as Cl_2
	8.3.8	**NIOSH** (15 min. ceiling)	Not established.	0.5 ppm
	** Chlorine is unlikely to be present as a decomposition product, but may be present in incidents of accidental mixing with other chemicals.*			

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES		
9.1	**Appearance:**	Greenish yellow liquid.
9.2	**Odor:**	Pungent.
9.3	**Odor Threshold:**	0.9 mg/m³.
9.4	**pH:**	11.2 – 11.4 (1% solution)
9.5	**Melting Point:**	Not pertinent.
9.6	**Freezing point:**	-23.3°C (-10°F)
9.7	**Boiling Point & Boiling Range:**	Decomposes @ 110°C (230°F)
9.8	**Flash Point:**	No information available.
9.9	**Evaporation Rate:**	No information available.
9.10	**Flammability (solid, gas):**	Not flammable.
9.11	**Upper / Lower Flammability or Explosive Limits:**	No information available.
9.12	**Vapor Pressure:**	12.1 mm Hg @ 20°C (68°F)
9.13	**Vapor Density:**	2.61 (air=1)
9.14	**Relative Density (Specific Gravity):**	1.2 g/mL or 10 lb/gallon @ 20°C (68°F)
9.15	**Solubility in Water:**	Mixes infinitely with water.
9.16	**Partition Coefficient: (n-octanol / water):**	No information available.
9.17	**Auto-ignition Temperature:**	No information available.
9.18	**Decomposition Temperature:**	Decomposes @ 110°C (230°F)
9.19	**Molecular Weight:**	74.5 g/mole
9.20	**Viscosity:**	1.75 - 2.50 centipoises (varies with temperature)

SECTION 10: STABILITY AND REACTIVITY		
10.1	**Stability:**	Stable under normal conditions of storage, handling, and use.
10.2	**Instability / Decomposition Temperature:**	All bleach decomposition is dependant on temperature. For any given temperature, the higher the strength, the faster it decomposes. In summary, for every 10°C increase in storage temperature, the sodium hypochlorite will decompose at an increased rate factor of approximately 3.5.
10.3	**Conditions of Instability:**	High heat, ultraviolet light.
10.4	**Incompatibility with Various Substances:**	Oxidizing agents, acids, nitrogen containing organics, metals, iron, copper, nickel, cobalt, organic materials, and ammonia.
10.5	**Corrosivity:**	Corrosive to metals.
10.6	**Special Remarks on Reactivity:**	Rate of decomposition increases with heat. May develop chlorine if mixed with acidic solutions.
10.7	**Special Remarks on Corrosivity:**	None.
10.8	**Hazardous Polymerization:**	Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION			
11.1	**Routes of Entry:**		Eyes, skin, ingestion, dermal absorption.
11.2	**Acute Toxicity:**		
	11.2.1	**Oral Toxicity** (LD_{50})**:**	3-5 g/kg (rat)
	11.2.2	**Dermal Toxicity** (LD_{50})**:**	>2 g/kg (rabbit)
	11.2.3	**Primary Eye Irritation:**	Corrosive
	11.2.4	**Primary Skin Irritation:**	Corrosive
	11.2.5	**Inhalation Toxicity** (LC_{50}):	No data available.
11.3	**Chronic Effects (Human Risk Assessment):**		Based on the toxicity profile and exposure scenarios for sodium hypochlorite, EPA concludes that the risks from chronic and subchronic exposure to low levels of these pesticides are minimal and without consequence to human health.
11.4	**Tolerance Requirement:**		Exempt (EPA document “Index to Pesticide Chemical Names, Part 180 Tolerance Information, and Food and Feed Commodities (by Commodity)” July 2010

SECTION 12: ECOLOGICAL INFORMATION			
12.1	**Ecotoxicity:**		Sodium hypochlorite is low in toxicity to avian wildlife, but it is highly toxic to freshwater fish and invertebrates.
	12.1.1	**Freshwater Fish Toxicity:**	Atlantic Herring (clupea harengus) LC_{50} = 0.033 - 0.097 mg//l/96 hr, flow through bioassay (pH: 8) Shiner Perch (cymatogaster aggregata) LC_{50} = 0.045 - 0.098 mg/l/96 hr, flow through bioassay (pH: 8) Three Spine Stickleback (gasterosteus aculeatus) LC_{50} = 0.141 - 0.193 mg/l/96 hr, flow through bioassay (pH: 8) Pink Salmon (oncorhynchus gorbuscha) LC_{50} = 0.023 - 0.052 mg/l/96 hr, flow through bioassay (pH: 8) Coho Salmon (oncorhynchus kisutch) LC_{50} = 0.026 - 0.038 mg/l/96 hr, flow through bioassay (pH: 8) English Sole (parophrys vetulus) LC_{50} = 0.044 - 0.144 mg/l/96 hr, flow through bioassay (pH: 8) Fat Head Minnow (pimephales promelas) LC_{50} = 0.22 - 0.62 mg/l/96 hr, flow through bioassay (pH: 7)
	12.1.2	**Invertebrate Toxicity:**	Water Flea (ceriodaphnia sp. 0) LC_{50} = 0.006 mg/l/24 hr Water Flea (daphnia magna) LC_{50} = 0.07 - 0.7 mg/l/24 hr Water Flea (daphnia magna) LC_{50} = 2.1 mg/l/96 hr Fresh Water Shrimp (gammarus fasciatus) LC_{50} = 0.4 mg/l/96 hr No common name (nitocra spinipes) LC_{50} = 0.40 mg/l/96 hr Grass Shrimp (palaemonetes pugio) LC_{50} = 0.52 mg/l/96 hr
12.2	**Persistence:**		No data available.
12.3	**Environmental Fate:**		In fresh water, sodium hypochlorite breaks down rapidly into non-toxic compounds when exposed to sunlight. In seawater, chlorine levels decline rapidly; however, hypobromite (which is acutely toxic to aquatic organisms) is formed. EPA believes that the risk of acute exposure to aquatic organisms is sufficiently mitigated by precautionary labeling and National Pollutant Discharge Elimination System (NPDES) permit requirements.
12.4	**Bioconcentration:**		This material is not expected to bioconcentrate in organisms.
12.5	**Biodegradation:**		This material is inorganic and not subject to biodegradation.

SECTION 13: DISPOSAL CONSIDERATIONS

Do not contaminate food or feed by storage, disposal, or cleaning of equipment. Product or rinsates that cannot be used should be diluted with water before disposal in a sanitary sewer. This product can be neutralized with sodium bisulfite, sodium thiosulfate, sodium sulfite. Do not confuse these products with sulfates or bisulfates. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination system (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not contaminate water containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA. Dispose of in accordance with all applicable local, County, State, and Federal regulations.

SECTION 14: TRANSPORT INFORMATION

14.1	**Inside containers 1.3 gallons or less.**		
	14.1.1	**DOT Classification:**	Consumer Commodity.
	14.1.2	**DOT Hazard Class:**	ORM-D.
	14.1.3	**Marking:**	Consumer Commodity, ORM-D.
	14.1.4	**Marine Pollutant:**	Not listed in Appendix B of the Hazardous Material Table.
	14.1.5	**Deposit Container Returns:**	RESIDUE: LAST CONTAINED CONSUMER COMMODITY ORM-D.
14.2	**Inside containers or single containers exceeding 1.3 gallons.**		
	14.2.1	**DOT Classification:**	Hypochlorite Solutions.
	14.2.2	**DOT Hazard Class:**	8, UN1791, P.G. III.
	14.2.3	**Label:**	Corrosive 8.
	14.2.4	**Deposit Container Returns:**	RESIDUE: LAST CONTAINED, UN 1791, HYPOCHLORITE SOLUTIONS, 8, PGIII,
14.3	**Reportable Quantity (RQ):**		100 lb (45.4 kg) or 80 gallons (based on 12.5% active ingredient)
14.4	**Materials of Trade (MOT) Exceptions.** Certain hazardous materials transported in small quantities as part of a business are subject to less regulation, because of the limited hazard they pose. These materials are known as Materials of Trade. The regulations that apply to MOTs are found in 49 CFR § 173.6.		

This information is not intended to convey all specific regulatory or operational requirements / information relating to this product. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15: REGULATORY INFORMATION

15.1	**U.S. Regulations:**		
	15.1.1	**OSHA HAZCOM** (Hazard Communication)	This material is considered hazardous under the HAZCOM Standard (29 CFR 1910.1200)
	15.1.2	**OSHA PSM** (Process Safety Management)	Not regulated under PSM Standard (29 CFR 1910.119)
	15.1.3	**EPA FIFRA** (Federal Insecticide, Fungicide and Rodenticide Act)	EPA Reg. No. :10897-26 (Registered pesticide under 40 CFR 152.10)
	15.1.4	**EPA TSCA** (Toxic Substance Control Act)	All components are listed or exempted. TSCA 12(b): This product is not subject to export notification.
	15.1.5	**EPA CERCLA** (Comprehensive Environmental Response, Compensation, and Liability Act)	Reportable Quantity (RQ): 45.4 kg (100 lbs) or 80 gallons (based on 12.5% active ingredient).
	15.1.6	**EPA RMP** (Risk Management Plan)	Not listed. (40 CFR 68.130)
15.2	**State of California Regulations:**		
	15.2.1	**Safe Drinking Water and Toxic Enforcement Act of 1986 [Proposition 65, California only]:** Small quantities – less than 100 ppm (parts per million) – of impurities, including bromates, may be found in all chlorinating products, including this product. Bromates are derived from bromides, which are present in sodium chloride (table salt) from which chlorine is manufactured. Additional small quantities of bromates may be generated during the disinfection process. Bromates are known by the State of California to cause cancer when administered by the oral (drinking or ingesting) route. Read and follow label directions and use care when handling or using this product. The US Environmental Protection Agency has established a maximum contaminant level (MCL) for bromates in drinking water at 10 ppb (parts per billion). Application of this product in accordance with label directions at use dilution will not exceed this level. This warning is provided pursuant to Proposition 65, Chapter 6.6 of the California Health and Safety Code, which requires the Governor of California to publish a list of chemicals “known to the State to cause cancer or reproductive toxicity.” This list is compiled in accordance with the procedures established under the proposition, and can be obtained on the internet from California’s Office of Environmental Health Hazard Assessment at http://www.oehha.ca.gov.	
	15.2.2	**CDPR** (California Department of Pesticide Regulation)	Registration No: 10897-26-AA
	15.2.3	**CalARP** (California Accidental Release Prevention Program)	Not regulated.
15.3	**Canada Regulations:**		
	15.3.1	**WHMIS** (Workplace Hazardous Materials Information System)	• Classification: E (Corrosive Materials) • Health Effects Criteria Met by this Chemical: ▪ E - Corrosive to skin ▪ E - TDG class 8 - corrosive substance • Ingredient Disclosure List: Included for disclosure at 1% or greater.
	15.3.2	**DSL** (Domestic Substances List)	All components of this product are on the DSL.
15.4	**International Inventory:**		
	15.4.1	**AICS** (Australian Inventory of Chemical Substances)	On inventory or in compliance with inventory.
	15.4.2	**KECI** (Korean Existing Chemicals Inventory)	On inventory or in compliance with inventory.
	15.4.3	**PICCS** (Philippine Inventory of Chemicals and Chemical Substances)	On inventory or in compliance with inventory.
	15.4.4	**IECSC** (Inventory of Existing Chemical Substances in China)	On inventory or in compliance with inventory.
	15.4.5	**NZIoC** (New Zealand Inventory of Chemicals)	On inventory or in compliance with inventory.

SECTION 16: OTHER INFORMATION				
16.1	**HMIS III** (Hazardous Materials Identification System):			
	16.1.1	**HEALTH**	**2**	
	16.1.2	**FLAMMABILITY**	**0**	
	16.1.3	**PHYSICAL HAZARD**	**1**	
	16.1.4	**PERSONAL PROTECTION**	See Section 8.	
16.2	**NFPA 704** (National Fire Protection Association):			
	16.2.1	**HEALTH**	**2**	
	16.2.2	**FLAMMABILITY**	**0**	
	16.2.3	**INSTABILITY**	**0**	
	16.2.4	**SPECIAL**	**None**	
16.3	**International Fire Code / International Building Code:**		Irritant.	
16.4	**ANSI** (American National Standards Institute):			
	16.4.1	**Hazardous Industrial Chemicals -** SDS-Preparation:	Complies with **ANSI Z400.1 – 2004**.	
	16.4.2	**Hazardous Industrial Chemicals -** Precautionary Labeling:	Complies with **ANSI Z129.1 – 2006**.	

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Univar USA Inc Safety Data Sheet

For Additional Information contact SDS Coordinator during business hours, Pacific time: (425) 889-3400

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SAFETY DATA SHEET

Aqua Ammonia (5-19.9%)

Airgas
an Air Liquide company

Section 1. Identification

GHS product identifier : Aqua Ammonia (5-19.9%)

Other means of identification : Aqua Ammonia, Ammonium Hydroxide

Product type : Liquid.

Product use : Synthetic/Analytical chemistry.

Synonym : Aqua Ammonia, Ammonium Hydroxide

SDS # : 001196

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN CORROSION - Category 1B
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
AQUATIC HAZARD (ACUTE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : May displace oxygen and cause rapid suffocation.
Causes severe skin burns and eye damage.
May cause respiratory irritation.
Very toxic to aquatic life.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling.

Response : Collect spillage. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 2. Hazards identification

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Aqua Ammonia, Ammonium Hydroxide

Product code : 001196

Ingredient name	%	CAS number
Aqua Ammonia	100	1336-21-6
WATER	80.1 - 95	7732-18-5
ammonia	5 - 19.9	7664-41-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : May cause respiratory irritation.

Skin contact : Causes severe burns.

Section 4. First aid measures

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:, pain, watering, redness

Inhalation : Adverse symptoms may include the following:, respiratory tract irritation, coughing

Skin contact : Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur

Ingestion : Adverse symptoms may include the following:, stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
nitrogen oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Section 6. Accidental release measures

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Avoid release to the environment. Do not ingest. Empty containers retain product residue and can be hazardous. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Do not breathe vapor or mist.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Aqua Ammonia WATER ammonia	None. None. **California PEL for Chemical Contaminants (*Table AC-1*) (United States).** PEL: 25 ppm 8 hours. STEL: 35 ppm 15 minutes. **ACGIH TLV (United States, 3/2017).** TWA: 25 ppm 8 hours. TWA: 17 mg/m³ 8 hours. STEL: 35 ppm 15 minutes. STEL: 24 mg/m³ 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** STEL: 35 ppm 15 minutes. STEL: 27 mg/m³ 15 minutes. **NIOSH REL (United States, 10/2016).** TWA: 25 ppm 10 hours. TWA: 18 mg/m³ 10 hours.

Section 8. Exposure controls/personal protection

	STEL: 35 ppm 15 minutes. STEL: 27 mg/m³ 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 50 ppm 8 hours. TWA: 35 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Colorless.

Odor : Pungent.

Odor threshold : Not available.

pH : Approx. 11.6 for 1 N Sol'n. in water

Melting point : 22°F (5% solution) to −34°F (19.9% solution)

Boiling point : Lowest known value: 38°C (100.4°F) (ammonia). Weighted average: 68.21°C (154.8°F)

Critical temperature : Not available.

Flash point : Not available.

Section 9. Physical and chemical properties

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Highest known value: 0.6 to 1.2 (Air = 1) (ammonia).

Gas Density (lb/ft ^{3}) : Weighted average: 0.33

Relative density : Not available.

Solubility : Not available.

Solubility in water : Complete

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

Flow time (ISO 2431) : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Aqua Ammonia ammonia	LD50 Oral LC50 Inhalation Gas.	Rat Rat	350 mg/kg 7338 ppm	- 1 hours

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Aqua Ammonia	Eyes - Severe irritant Eyes - Severe irritant	Rabbit Rabbit	- -	250 Micrograms 0.5 minutes 1 milligrams	- -

Sensitization

Not available.

Section 11. Toxicological information

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Aqua Ammonia	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : May cause respiratory irritation.

Skin contact : Causes severe burns.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:, pain, watering, redness

Inhalation : Adverse symptoms may include the following:, respiratory tract irritation, coughing

Skin contact : Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur

Ingestion : Adverse symptoms may include the following:, stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Section 11. Toxicological information

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Aqua Ammonia ammonia	Acute LC50 37 ppm Fresh water Acute EC50 29.2 mg/l Marine water Acute LC50 2080 µg/l Fresh water Acute LC50 0.53 ppm Fresh water Acute LC50 300 µg/l Fresh water Chronic NOEC 0.204 mg/l Marine water	Fish - Gambusia affinis - Adult Algae - Ulva fasciata - Zoea Crustaceans - Gammarus pulex Daphnia - Daphnia magna Fish - Hypophthalmichthys nobilis Fish - Dicentrarchus labrax	96 hours 96 hours 48 hours 48 hours 96 hours 62 days

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
WATER	-1.38	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN2672	UN2672	UN2672	UN2672	UN2672
UN proper shipping name	Ammonium Hydroxide or Ammonia solutions	AMMONIA SOLUTION	AMMONIA SOLUTION	AMMONIA SOLUTION	Ammonia solution
Transport hazard class(es)	8 	8 	8 	8 	8 
Packing group	III	III	III	III	III
Environmental hazards	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.	Yes.	Yes. The environmentally hazardous substance mark is not required.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : This product is not regulated as a marine pollutant when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes, provided the packagings meet the general provisions of §§ 173.24 and 173.24a. **Reportable quantity** 1000 lbs / 454 kg. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.40-2.42 (Class 8), 2.7 (Marine pollutant mark).
The marine pollutant mark is not required when transported by road or rail.

IMDG : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

Clean Water Act (CWA) 311: ammonia; ammonia

Clean Air Act (CAA) 112 regulated toxic substances: ammonia

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Section 15. Regulatory information

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
ammonia	5 - 19.9	Yes.	500	-	100	-

SARA 304 RQ : 502.5 lbs / 228.1 kg

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	ammonia ammonia	1336-21-6 7664-41-7	100 5 - 19.9
Supplier notification	ammonia ammonia	1336-21-6 7664-41-7	100 5 - 19.9

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: AMMONIUM HYDROXIDE; AMMONIUM WATER; AMMONIA; AMMONIA, ANHYDROUS

New York : The following components are listed: Ammonium hydroxide; Ammonia

New Jersey : The following components are listed: AMMONIUM HYDROXIDE; AMMONIA

Pennsylvania : The following components are listed: AMMONIUM HYDROXIDE; AMMONIA

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : All components are listed or exempted.

Canada : All components are listed or exempted.

China : All components are listed or exempted.

Europe : All components are listed or exempted.

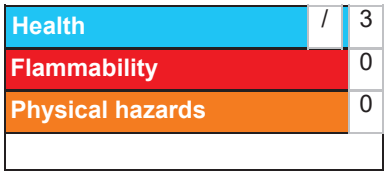
Japan : **Japan inventory (ENCS)**: All components are listed or exempted.
Japan inventory (ISHL): Not determined.

Section 15. Regulatory information

Malaysia	:	All components are listed or exempted.
New Zealand	:	All components are listed or exempted.
Philippines	:	All components are listed or exempted.
Republic of Korea	:	All components are listed or exempted.
Taiwan	:	All components are listed or exempted.
Thailand	:	Not determined.
Turkey	:	Not determined.
United States	:	All components are listed or exempted.
Viet Nam	:	Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
SKIN CORROSION - Category 1B	Expert judgment
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Calculation method
AQUATIC HAZARD (ACUTE) - Category 1	Calculation method

History

Date of printing	:	1/11/2018
Date of issue/Date of revision	:	1/11/2018
Date of previous issue	:	12/20/2016
Version	:	0.08

Section 16. Other information

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Univar USA Inc Safety Data Sheet

SDS No:

Version No: 002 2015-11-12

Order No:

3075 Highland Pkwy, Ste 200, Downers Grove, IL 60515
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

SAFETY DATA SHEET

SODIUM FLUORIDE Coarse

Revision Date 11/05/2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name SODIUM FLUORIDE Coarse

1.2 Relevant identified uses of the substance or mixture and uses advised against

Uses of the Substance / Mixture

- Welding and soldering agents
- Metallurgy.
- Glass industry
- Dental application
- Water treatment

1.3 Details of the supplier of the safety data sheet

Company

SOLVAY FLUORIDES, LLC
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: +1-800-7658292; +1-713-5256700
Fax: +1-713-5257805

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture

HCS 2012 (29 CFR 1910.1200)

Acute toxicity, Category 3 H301: Toxic if swallowed.

2.2 Label elements

HCS 2012 (29 CFR 1910.1200)

Pictogram

Signal Word

- Danger

Hazard Statements

- H301 Toxic if swallowed.

Precautionary Statements

Prevention

- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.

Response

- P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.

Storage

- P405 Store locked up.

Disposal

- P501 Dispose of contents/ container to an approved waste disposal plant.

Additional Labeling

- The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 100 %

2.3 Other hazards which do not result in classification

- Toxic if swallowed.
- Irritating to eyes and skin.
- Hazardous decomposition products formed under fire conditions.
- Contact with acids liberates very toxic gas.

SECTION 3: Composition/information on ingredients

3.1 Substance

Hazardous Ingredients and Impurities

Chemical Name	Identification number CAS-No.	Concentration [%]
sodium fluoride	7681-49-4	>= 99

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

3.2 Mixture

Not applicable, this product is a substance.

SECTION 4: First aid measures

4.1 Description of first-aid measures

In case of inhalation

- Remove the subject from dusty environment and let him blow his nose.
- Oxygen or artificial respiration if needed.
- If symptoms persist, call a physician.

In case of skin contact

- Take off contaminated clothing and wash before reuse.
- Wash off immediately with soap and plenty of water.
- If symptoms persist, call a physician.

In case of eye contact

- Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
- Consult a physician.

In case of ingestion

- Immediate medical attention is required.
- Take victim immediately to hospital.

- If victim is conscious:
- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.

- If victim is unconscious:
- Artificial respiration and/or oxygen may be necessary.

4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation

Effects
- Irritating to mucous membranes
- At high concentrations:
- risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia

Repeated or prolonged exposure

- Risk of sore throat, nose bleeds
- Nose bleeding
- chronic bronchitis

In case of skin contact

Symptoms
- Irritation

Effects

Repeated or prolonged exposure

- Causes burns.

In case of eye contact

Symptoms
- Redness
- Lachrymation

Effects
- Severe eye irritation
- Risk of temporary eye lesions.

In case of ingestion

Symptoms
- Severe irritation
- Salivation
- Nausea
- Vomiting
- Abdominal pain
- Diarrhea

Effects
- risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia

- Risk of convulsions, loss of consciousness, deep coma and cardiopulmonary arrest.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

Exposure to decomposition products
- Call a physician immediately.
- Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point	Not applicable
Autoignition temperature	Not applicable
Flammability / Explosive limit	no data available

5.1 Extinguishing media

Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media

- none

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting

- The product is not flammable.
- Not combustible.
- Heating can release hazardous gases.

Hazardous combustion products:

- Hydrogen fluoride
- The release of other hazardous decomposition products is possible.

5.3 Advice for firefighters

Special protective equipment for fire-fighters

- In the event of fire, wear self-contained breathing apparatus.
- Fire fighters must wear fire resistant personnel protective equipment.
- Wear chemical resistant oversuit

Further information

- Control the use of water due to environmental risk (see section 6).

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel

- Avoid dust formation.

Advice for emergency responders

- Sweep up to prevent slipping hazard.

6.2 Environmental precautions

- If the product contaminates rivers and lakes or drains inform respective authorities.
- Do not flush into surface water or sanitary sewer system.

6.3 Methods and materials for containment and cleaning up

- Sweep up and shovel into suitable containers for disposal.
- Avoid dust formation.
- Keep in properly labeled containers.
- Keep in suitable, closed containers for disposal.
- Treat recovered material as described in the section "Disposal considerations".

6.4 Reference to other sections

- Refer to protective measures listed in sections 7 and 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Used in closed system
- Handle small quantities under a lab hood.
- Use only in well-ventilated areas.
- Use only equipment and materials which are compatible with the product.
- Keep away from heat.

Hygiene measures

- Eye wash bottles or eye wash stations in compliance with applicable standards.
- Use only in an area equipped with a safety shower.
- When using do not eat, drink or smoke.
- Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions

- Keep in a dry place.
- Store in original container.
- Keep container closed.

- Avoid dust formation.
- Refer to protective measures listed in sections 7 and 8.

- Keep away from:
- Incompatible products

Packaging material

Suitable material

- no data available

7.3 Specific end use(s)

- Contact your supplier for additional information

SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

Components with workplace occupational exposure limits

Ingredients	Value type	Value	Basis
sodium fluoride	TWA	2.5 mg/m3	National Institute for Occupational Safety and Health
	Expressed as :Fluorine		
sodium fluoride	TWA	2.5 mg/m3	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
	CAS number varies with compoundExpressed as :Fluorine		
sodium fluoride	TWA	2.5 mg/m3	American Conference of Governmental Industrial Hygienists
	Expressed as :Fluorine		

NIOSH IDLH (Immediately Dangerous to Life or Health Concentrations)

Ingredients	CAS-No.	Concentration
sodium fluoride	7681-49-4	250 milligram per cubic meter

Biological Exposure Indices

Ingredients	Value type	Value	Basis
sodium fluoride	BEI	2 mg/l Fluoride Urine Prior to shift (16 hours after exposure ceases)	American Conference of Governmental Industrial Hygienists
sodium fluoride	BEI	3 mg/l Fluoride Urine End of shift (As soon as possible after exposure ceases)	American Conference of Governmental Industrial Hygienists

8.2 Exposure controls

Control measures

Engineering measures

- Ensure adequate ventilation.
- Provide appropriate exhaust ventilation at places where dust is formed.
- Refer to protective measures listed in sections 7 and 8.
- Apply technical measures to comply with the occupational exposure limits.

Individual protection measures

Respiratory protection
- In case of insufficient ventilation, wear suitable respiratory equipment.
- When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
- Self-contained breathing apparatus in confined spaces/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

Hand protection
- Protective gloves - impervious chemical resistant:

Suitable material
- PVC
- Neoprene
- Natural Rubber

Eye protection
- Chemical resistant goggles must be worn.
- Dust proof goggles obligatory.

Skin and body protection
- Long sleeved clothing
- Apron/boots in case of dusts.
- Neoprene
- Natural Rubber

Hygiene measures
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- Use only in an area equipped with a safety shower.
- When using do not eat, drink or smoke.
- Handle in accordance with good industrial hygiene and safety practice.

SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

Appearance	Form: Physical state: Color:	crystalline, powder solid solid white white
Particle size		> 0.1 mm (90 %)
Odor		odorless
Odor Threshold		no data available
pH		7.4 (68 °F (20 °C)) saturated aqueous solution
Melting point/range		ca. 1818 °F (992 °C)

Boiling point/boiling range	ca. 3,092 °F (1,700 °C)
Flash point	Not applicable
Evaporation rate (Butylacetate = 1)	Not applicable
Flammability (solid, gas)	The product is not flammable.
Flammability / Explosive limit	Explosiveness: Not explosive
Autoignition temperature	Not applicable
Vapor pressure	1.00 mmHg (1.33 hPa) (1,971 °F (1,077 °C))
Vapor density	Not applicable
Density	Bulk density: 1,000 - 1,400 kg/m3
Solubility	Water solubility : 42 g/l (68 °F (20 °C))
Partition coefficient: n-octanol/water	Not applicable
Thermal decomposition	no data available
Viscosity	no data available
Explosive properties	no data available
Oxidizing properties	Not considered as oxidizing.

9.2 Other information

Molecular weight	42 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

- Incompatible with acids.

10.2 Chemical stability

- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- Contact with acids liberates very toxic gas.

10.4 Conditions to avoid

- Exposure to moisture.
- To avoid thermal decomposition, do not overheat.

10.5 Incompatible materials

- Strong acids
- glass

10.6 Hazardous decomposition products

- Hydrogen fluoride
- The release of other hazardous decomposition products is possible.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity

LD50 : 52 - 250 mg/kg - Rat

Acute inhalation toxicity

no data available

Acute dermal toxicity

LD 10 : ca. 300 mg/kg - Mouse

Acute toxicity (other routes of administration)

no data available

Skin corrosion/irritation

Rat
Skin irritation

Serious eye damage/eye irritation

Rabbit
Eye irritation

Respiratory or skin sensitization

not sensitizing

Mutagenicity

Genotoxicity in vitro

In vitro tests did not show mutagenic effects

Genotoxicity in vivo

In vivo tests did not show mutagenic effects

Carcinogenicity

no data available

This product does not contain any ingredient designated as probable or suspected human carcinogens by:
NTP
IARC
OSHA
ACGIH

Toxicity for reproduction and development

Toxicity to reproduction / fertility

Rat
NOAEL parent: 10 - 14 mg/kg

Rabbit
NOAEL parent: 14 mg/kg
not significant
Developmental Toxicity

Developmental Toxicity/Teratogenicity no data available

STOT

STOT-single exposure no data available

STOT-repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.

Oral 180 Days - Mouse
LOAEL: 50 ppm
Target Organs: Skeleton
Subchronic toxicity

Inhalation - Rat
NOAEL: 1 ppm
Target Organs: Respiratory Tract, Bone, Teeth

Aspiration toxicity no data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish

LC50 - 96 h : 51 mg/l - Fishes, Salmo gairdneri
static test

Fresh water

Acute toxicity to daphnia and other aquatic invertebrates.

EC50 - 48 h : 26 mg/l - Daphnia magna (Water flea)
Fresh water

EC50 - 96 h : 10.5 mg/l - Daphnia magna (Water flea)
salt water

Chronic toxicity to fish

NOEC: 4 mg/l - 21 Days - Oncorhynchus mykiss (rainbow trout)
static test
Fresh water

Chronic toxicity to daphnia and other aquatic invertebrates.

NOEC: 8.9 mg/l - 21 Days - Daphnia magna (Water flea)
static test
Fresh water

12.2 Persistence and degradability

Abiotic degradation

Photodegradation

Water/soil
complexation/precipitation of inorganic and organic materials

Biodegradation

Biodegradability

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Bioconcentration factor (BCF)

Not applicable

12.4 Mobility in soil

Adsorption potential (Koc)

Air
mobility as solid aerosols

Water
Solubility(ies)
Mobility

Soil/sediments
adsorption on mineral and organic soil constituents

12.5 Results of PBT and vPvB assessment no data available

12.6 Other adverse effects no data available

Ecotoxicity assessment

Acute aquatic toxicity Harmful to aquatic organisms.

Chronic aquatic toxicity . low chronic toxicity.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal

- In accordance with local and national regulations.
- Dilute with plenty of water.
- Can be eliminated from water by precipitation.
- Filtrate the product and send the cake to a landfill for industrial waste.
- Discharge liquid filtrate to a wastewater treatment system

Waste Code

- Environmental Protection Agency
- Hazardous Waste – NO

Advice on cleaning and disposal of packaging

- Empty containers.
- Dispose of as unused product.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
- Where possible recycling is preferred to disposal or incineration.
- In accordance with local and national regulations.

SECTION 14: Transport information

Transportation status: IMPORTANT! Statements below provide additional data on listed transport classification.
The listed Transportation Classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptors.

DOT

14.1 UN number	UN 1690
14.2 Proper shipping name	SODIUM FLUORIDE, SOLID
14.3 Transport hazard class	6.1
Label(s)	6.1
14.4 Packing group	
Packing group	III
ERG No	154
14.5 Environmental hazards	NO
Marine pollutant	

TDG

14.1 UN number	UN 1690
14.2 Proper shipping name	SODIUM FLUORIDE, SOLID
14.3 Transport hazard class Label(s)	6.1 6.1
14.4 Packing group Packing group ERG No	 III 154
14.5 Environmental hazards **Marine pollutant**	NO

NOM

14.1 UN number	UN 1690
14.2 Proper shipping name	SODIUM FLUORIDE, SOLID
14.3 Transport hazard class Label(s)	6.1 6.1
14.4 Packing group Packing group ERG No	 III 154
14.5 Environmental hazards **Marine pollutant**	NO

IMDG

14.1 UN number	UN 1690
14.2 Proper shipping name	SODIUM FLUORIDE, SOLID
14.3 Transport hazard class Label(s)	6.1 6.1
14.4 Packing group Packing group	 III
14.5 Environmental hazards **Marine pollutant**	NO
14.6 Special precautions for user EmS	 F-A , S-A

For personal protection see section 8.

IATA

14.1 UN number	UN 1690
14.2 Proper shipping name	SODIUM FLUORIDE, SOLID
14.3 Transport hazard class Label(s):	6.1 6.1
14.4 Packing group Packing group	III
Packing instruction (cargo aircraft) Max net qty / pkg Packing instruction (passenger aircraft) Max net qty / pkg	677 200.00 kg 670 100.00 kg
14.5 Environmental hazards	NO
14.6 Special precautions for user For personal protection see section 8.	

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information

15.1 Notification status

Inventory Information	Status
United States TSCA Inventory	- Listed on Inventory
Mexico INSQ (INSQ)	- In compliance with the inventory
Canadian Domestic Substances List (DSL)	- Listed on Inventory
New Zealand. Inventory of Chemical Substances	- In compliance with the inventory
Australia Inventory of Chemical Substances (AICS)	- Listed on Inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- Listed on Inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- Listed on Inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- Listed on Inventory
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- Listed on Inventory

15.2 Federal Regulations

US. EPA EPCRA SARA Title III

SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)

Fire Hazard	no
Reactivity Hazard	no
Sudden Release of Pressure Hazard	no
Acute Health Hazard	yes
Chronic Health Hazard	yes

Section 313 Toxic Chemicals (40 CFR 372.65)
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)
This material does not contain any components with a SARA 302 RQ.

Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)
This material does not contain any components with a section 304 EHS RQ.

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

Ingredients	CAS-No.	Reportable quantity
sodium fluoride	7681-49-4	1000 lb

15.3 State Regulations

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

SECTION 16: Other information

NFPA (National Fire Protection Association) - Classification

Health	3 serious
Flammability	0 minimal
Instability or Reactivity	0 minimal
Special Notices	None

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

Health	3 serious
Flammability	0 minimal
Reactivity	0 minimal
PPE	Determined by User; dependent on local conditions

Further information

- Product evaluated under the US GHS format.

Date Prepared: 11/05/2015

Key or legend to abbreviations and acronyms used in the safety data sheet

- TWA	8-hour, time-weighted average
- ACGIH	American Conference of Governmental Industrial Hygienists
- OSHA	Occupational Safety and Health Administration
- NTP	National Toxicology Program
- IARC	International Agency for Research on Cancer
- NIOSH	National Institute for Occupational Safety and Health

Univar USA Inc Safety Data Sheet

For Additional Information contact SDS Coordinator during business hours, Pacific time: (425) 889-3400

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All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process

ATTACHMENT V

ATTACHMENT V

GOLDEN STATE WATER COMPANY
BARSTOW CSA
WATER SUPPLY DETAILS

Period	AGATE WELL #4 SCE	AGATE WELL #5 SCE	AGATE WELL #6 SCE	ARROWHEAD WELLS SCE WELL #2	BRADSHAW WELLS SCE WELL #1	BRADSHAW WELLS SCE WELL #2	BRADSHAW WELL #4 SCE	BRADSHAW WELL #5 SCE	BRADSHAW WELL #6 SCE	BRADSHAW WELL #7 SCE	BRADSHAW WELL #10 SCE	BRADSHAW WELL #11 SCE	BRADSHAW WELL #12 SCE	BRADSHAW WELL #13 SCE	BRADSHAW WELL #14 SCE	CROOKS WELL #1 SCE	GLEN ROAD WELL #1 SCE	GLEN ROAD WELL #2 SCE	SOAPMINE WELL #2 SCE	Bradshaw Wells	Barstow Total	% Bradshaw
	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf	ccf			
2016	**213**	**2,918**	**117**	**340,609**	**353**	**377**	**6,395**	**8,522**	**348**	**127,958**	**741,289**	**5**	**0**	**327,197**	**328,080**	**0**	**130,684**	**226,960**	**0**	**1,540,524**	**2,242,025**	**69%**
2017	**1,267**	**1,124**	**23**	**2,614**	**37,000**	**13,638**	**197**	**126,936**	**55**	**537,412**	**815,948**	**696**	**0**	**496,607**	**294**	**303**	**0**	**352,133**	**0**	**2,028,783**	**2,386,247**	**85%**
2018	**19,605**	**6,613**	**35**	**10,421**	**50,997**	**0**	**19**	**127,048**	**57,035**	**297,068**	**248,127**	**5,716**	**345,337**	**377,382**	**5,299**	**0**	**398,791**	**491,149**	**0**	**1,514,028**	**2,440,642**	**62%**
January 2019	12,969	5,249	0	1,663	0	0	0	5	291	934	0	28,561	510	9,683	399	0	34,858	48,672	0			
February 2019	3,471	1,356	0	153	0	0	0	0	464	1,391	0	33,475	0	13,756	0	0	3,898	61,292	0			
March 2019	6,003	2,395	0	345	0	0	4,401	0	389	2,937	0	37,722	431	11,992	813	0	29,529	60,566	0			
April 2019	8,692	4,110	54	0	0	0	396	0	4,811	9,430	0	30,484	1,415	22,498	284	0	53,364	49,046	0			
May 2019	1,735	622	0	456	0	0	231	0	2,452	8,995	0	42,207	6,743	26,109	0	0	54,193	56,514	0			
June 2019	2,645	531	0	14	0	0	0	0	5,798	10,952	0	28,280	41,334	36,640	0	0	75,325	40,143	0			
July 2019	3,867	281	0	6	0	327	1,000	0	5,323	12,050	2,441	36,369	29,718	47,591	10,526	0	82,098	55,481	0			
August 2019	1,024	231	0	92	0	595	757	0	7,042	9,068	3,702	48,853	31,196	36,347	12,526	0	82,483	47,913	0			
September 2019	562	160	0	0	0	465	133	0	3,893	9,746	2,230	48,063	15,149	29,734	8,160	0	81,871	35,497	0			
October 2019	1,031	441	0	0	0	842	458	0	702	3,665	905	37,293	16,885	17,601	6,644	0	80,222	46,046	0			
November 2019	10	6	0	0	0	231	651	0	241	1,310	298	12,061	13,974	14,782	4,589	0	67,830	59,766	0			
December 2019	7	5	0	0	0	26	29	0	154	298	337	12,708	3,957	9,334	2,214	0	51,651	64,613	0			
YTD 2019	42,016	15,387	54	2,729	0	2,486	8,056	5	31,560	70,776	9,913	396,076	161,312	276,067	46,155	0	697,322	625,549	0	**1,002,406**	**2,385,463**	**42%**
January 2020	34	21	4	0	0	235	1,475	0	283	636	347	15,513	1,890	11,306	1,652	0	50,777	64,846	0			
February 2020	34	24	0	0	0	315	294	0	872	1,563	956	16,184	289	12,040	1,777	0	53,128	57,829	0			
March 2020																						
April 2020																						
May 2020																						
June 2020																						
July 2020																						
August 2020																						
September 2020																						
October 2020																						
November 2020																						
December 2020																						
YTD 2020	68	45	4	0	0	550	1,769	0	1,155	2,199	1,303	31,697	2,179	23,346	3,429	0	103,905	122,675	0			

ATTACHMENT W

Project Cost Estimate

Project Title

Agnes Circle Area Main Replacement

Agnes Cir, Moraine Cir, Thores St & Rinda Dr; Octavia Way, Chase to Agnes, and Sally Ct; Rhoda Way and Maxine Way

Budget Year

(All estimates are calculated in 2016 unit costs)

Region/District	Region I	Northern
Customer Service Area		Arden-Cordova
Water Distribution System		Cordova

Project Need

Project Description

Main Diameter:	8"
Main Material:	PVC
Main Length:	8750
# of Fire Hydrants:	19
# of Services (less than 4"):	189
# of Large Services (4" and larger):	9

Total Project Cost (2016 dollars):

Design	$72,800
Construction	$3,459,900
Total	$3,532,700

Contingency and Escalation are added to costs in 2018-2020 Project Lists

Total Project Cost (with OH, Contingency and Escalation included):

Design	$72,800
Construction	$ 4,353,938
Total	$4,426,738

Construction Cost Estimate

Project:	Agnes Circle Area Main Replacement	Region	Region I
Limits:	Agnes Cir, Moraine Cir, Thores St & Rinda Dr;	District	Northern
	Octavia Way, Chase to Agnes, and Sally Ct;	System	Cordova

Estimate By: SJ/PTS/MV CPM-38 Approved By: _____

Estimate Date 02/09/17 10/15/19

Item No	Description	Quantity	Unit	2016 Unit Cost	Cost
1	Main	8750	L.F.	$235	$2,056,300
2	Fire Hydrants	19	Ea.	$9,295	$176,600
3	Services (less than 4")	189	Ea.	$2,852	$539,000
4	Large Services (4" and larger)	9	Ea.	$20,000	$180,000
5	New Customer Line	198	Ea.	$1,400	$277,200
6	Special Circ. - Permit & Grounding Rods	198	LS	$650	$128,700
7	Special Circ. - Abandon Existing Services	187	Ea.	$505	$94,400
8	Special Circumstances - Micro-Seal	131250	SF	$0.60	$78,800
9	Agnes Plant - discharge piping to new main	110	L.F.	$600	$66,000
10	Traffic Control	1	LS	$25,000	$25,000
11	Bore Sideyard Main	1	LS	$20,000	$20,000
	Total Cost*				$3,642,000
	Design (2%)				$72,800
	Construction (95%)				$3,459,900

*Includes permits, engineering, inspection, District/Regional costs, insurance, tools, taxes, construction services and overhead

		Project Number:	**22911113**			
		Project Name:	**Main Street Area Main Replacement**			
Obj.	**Subs.**					
		Contract Work	**Cost**	**QTY**	**Unit**	**Cost/Unit**
		Preliminary Estimate - Based on Lowest Bid From PPI				
---	---	Furnish and install 6-inch PVC Pipe, AWWA C-900, CL 235, DR 18. Described in Sec. 1000 Part 2.1.	$ 36,000.00	160	LF	$ 225.00
---	---	Furnish and install 8-inch PVC Pipe, AWWA C-900, CL 235, DR 18. Described in Sec. 1000 Part 2.1.	$ 484,500.00	5100	LF	$ 95.00
		Furnish and install 12-inch PVC Pipe, AWWA C-900, CL 235, DR 18. Described in Sec. 1000 Part 2.1.	$ 48,000.00	120	LF	$ 400.00
---	---	Furnish and install 8-inch resilient wedge gate valve. Described in Sec. 1000 Part 2.2.	$ 51,875.00	25	EA	$ 2,075.00
		Furnish and install 6-inch x 6-inch tapping sleeve with 6-inch tapping valve. Described in Sec. 1000 Part 2.3.	$ 4,000.00	1	EA	$ 4,000.00
---	---	Furnish and install 6-inch standard wet barrel fire hydrant. Described in Sec. 1000 Part 2.4.	$ 105,000.00	14	EA	$ 7,500.00
---	---	Furnish and install 1-inch water service with new meter box. Described in Sec. 1000 Part 2.5.	$ 140,300.00	122	EA	$ 1,150.00
---	---	Adjust customer service line to new water service meter box. Described in Sec. 1000 Part 2.6.	$ 1,500.00	3	EA	$ 500.00
---	---	Furnish and install a new customer service line to the new water service meter box. Described in Sec. 1000 Part 2.7.	$ 12,000.00	6	EA	$ 2,000.00
		Cut & plug existing system water mains. Described in Sec. 1000 Part 2.8.	$ 3,900.00	13	EA	$ 300.00
		Furnish and install 4-inch flushout. Described in Sec. 1000 Part 2.9.	$ 16,800.00	6	EA	$ 2,800.00
		Abandon and remove existing fire hydrant. Described in Sec. 1000 Part 2.10.	$ 3,108.00	7	EA	$ 444.00
		Abandon and remove existing flush-out. Described in Sec. 1000 Part 2.11.	$ 2,408.00	7	EA	$ 344.00
		Abandon existing small size service and remove meter box. Described in Sec. 1000 Part 2.12.	$ 198.00	3	EA	$ 66.00
		Remove and dispose of 6-inch asbestos cement pipe. Described in Sec. 1000 Part 2.13.	$ 2,000.00	50	LF	$ 40.00
---	---	Abandon valve and remove valve box. Described in Sec. 1000 Part 2.14.	$ 1,600.00	16	EA	$ 100.00
---	---	Furnish, install, maintain and remove the project information sign. Described in Sec. 1000 Part 2.15.	$ 1,600.00	2	EA	$ 800.00
---	---	Provide and install 1¾" grind and cap of asphalt rubberized hot mix pavement on Orange Avenue. Described in Sec. 1000 Part 2.16.	$ 18,000.00	2250	SF	$ 8.00
---	---					
		Alt Bid Item:				
		Furnish additional potholes for existing utilities not shown on the plans but marked by USA and/or discovered during excavation of the pipe trench. Described in Sec. 1000 Part 2.17.	$ 2,500.00	10	EA	$ 250.00
		CO-1 added 2-2" services	$ 11,600.00	1		$ 11,600.00
		WCDs - 1-2, and 4-11	$ 96,870.00	1		$ 96,870.00
---	---	CO-3 Final	$ 2,866.00	1		$ 2,866.00
1231	---	Total Contract Work Material & Equipment	**$ 1,046,625.00**			
		Internal Labor - RT				
1221	200	Planning	$ -			
1221	201	Design	$ 6,546.92			Actual
1221	202	Electrical Engineering	$ -			
1221	203	Geotechnical Engineering	$ -			
1221	204	Surveying	$ -			
1221	205	Instrumentation & Control	$ -			
1221	206	Easement/Escrow Assistance	$ -			
1221	207	Hydrogeological Engineering	$ -			
1221	208	Construction Management	$ 15,000.00			
1221	103	Operations Support	$ 5,000.00			
1221	209	Permitting by GSWC labor				
1221	105	General & Administrative	$ 4,000.00			
1221	106	Construction by GSWC labor	$ 250.00			

Obj.	Subs.					
		Project Number:	**22911113**			
		Project Name:	**Main Street Area Main Replacement**			
		Contract Work	**Cost**	**QTY**	**Unit**	**Cost/Unit**
		Preliminary Estimate - Based on Lowest Bid From PPI				
1224	---	Labor Burden (calculation)				
---	---	Sub-Total	$ 30,796.92			
---	---	IT&T - Labor Burdens	60%			
---	---	Total Internal Labor	$ 49,275.07			
		Materials & Supplies				
1201	---	Company Supplied Material	$ -			
1210	---	Direct Purchase (vehicle, tools, etc.)	$ -			
---	---	Total Materials & Supplies	$ -			
		Outside Services				
1232	200	Planning	$ 1,150.00			
1232	201	Design	$ 51,811.56			
1232	202	Electrical Engineering	$ -			
1232	203	Geotechnical Engineering	$ -			
1232	204	Traffic Control Plans	$ 6,400.00			
1232	205	Instrumentation & Control	$ -			
1232	206	Easement/Escrow Assistance	$ -			
1232	207	Hydrogeological Engineering	$ -			
1232	208	Construction Management	$ 25,000.00			
1232	209	Permitting Assistance	$ -			
---	---	Total Services	$ 84,361.56			
		Permits				
1240	104	Permits	$ 10,000.00			
		Miscellaneous Services/Purchases				
	---	Lawyer, Rent, Owned Equip, Misc.	$ -			
		Transportation				
1225	---	Transportation	$ 1,500.00			
		Total Installation				
---	---	Sub Total-Installation	$ 1,191,761.63			
		Project Contingency				
---	---	Project Contingency	$ 59,588.08			5.00%
---	---	General Overhead	14%			
---	---	Total Installation	$ 1,431,544.07			
		Removals and/or Demolition Items				
---	---	Remove FHs	$ -	0		$ -
---	---	Remove Valve Can and covers	$ -	0		$ -
---	---	C&Ps	$ -	0		$ -
1253	---	Total Cost of Removal	$ -			
		Total Work Order				
---	---	**Total Work Order Cost**	**$ 1,431,544.07**			

		Project Number:	**23611172**				
		Project Name:	Higuera Bridge Main Replacement				
Object	**Subsidiary**	**Components of Construction Cost:**					
		Contract Work	**Unit Cost**	**QTY**	**Unit**	**Cost**	**Notes**
		Based On Bid Package Basis of Bid Items and Quantities					
---	---	Provide & Install 12" DI	$ 325.00	765	FT	$ 248,625.00	
---	---	Provide & Install 12" CML & Epoxy Coated Pipe	$ 350.00	175	FT	$ 61,250.00	Accoss Bridge
---	---	Provide & Install 8" DI	$ 200.00	20	FT	$ 4,000.00	
---	---	Provide & Install 6" DI	$ 200.00	25	FT	$ 5,000.00	
---	---	Provide & Install 12" Forced Balance Flexible Expansion Joint	$ 45,000.00	2	EA	$ 90,000.00	
---	---	Provide and Install 12" Butterfly Valves	$ 6,000.00	3	EA	$ 18,000.00	
---	---	Provide and Install 8" Gate Valves	$ 4,000.00	1	EA	$ 4,000.00	
---	---	Provide and Install 6" Gate Valves	$ 3,500.00	1	EA	$ 3,500.00	
---	---	Provide and Install 6" Fire Hydrant	$ 12,000.00	1	EA	$ 12,000.00	
---	---	Reconnect Existing Fire Service	$ 7,000.00	1	EA	$ 7,000.00	
---	---	Provide & Install 2" Irrigation Service	$ 6,000.00	1	EA	$ 6,000.00	
---	---	Cut & Plug Existing Water Mains	$ 5,000.00	3	EA	$ 15,000.00	
---	---	Remove Valve Can Lids on Abandoned Lines, Backfill, Compact and Resurface in Kind	$ 500.00	2	EA	$ 1,000.00	
---	---	Remove and Dispose of AC Pipe	$ 250.00	20	FT	$ 5,000.00	
---	---	Provide and Install, Remove and Return GSWC Construction Signs	$ 1,000.00	2	EA	$ 2,000.00	
---	---	Provide Traffic Control Paln per City of Los Angeles and Culver City permit requirements	$ 10,000.00	1	EA	$ 10,000.00	
---	---	Provide and Install AC Pavement over Trench Detail in Paved Area Complete	$ 10.00	4,590	SF	$ 45,900.00	
---	---	Repair Concrete Median in Kind	$ 100.00	50	SF	$ 5,000.00	
1231	---	Total Contract Work Material & Equipment	**$ 543,275.00**				
		Internal Labor - RT					
1221	200	Planning	$ -				
1221	201	Design	$ 10,000.00				
1221	202	Electrical Engineering	$ -				
1221	203	Geotechnical Engineering	$ -				
1221	204	Surveying	$ -				
1221	205	Instrumentation & Control	$ -				
1221	206	Easement/Escrow Assistance	$ -				
1221	207	Hydrogeological Engineering	$ -				
1221	208	Construction Management	$ 11,000.00				
1221	103	Operations Support	$ 5,000.00				
1221	209	Permitting by GSWC labor	$ 700.00				
1221	105	General & Administrative	$ 10,000.00				
1221	106	Construction by GSWC labor	$ -				
1224	---	Labor Burden (calculation)					
---	---	Sub-Total	$ 36,700.00				
---	---	IT&T - Labor Burdens	60%				
---	---	Total Internal Labor	$ 58,720.00				
		Materials & Supplies					
1201	---	Company Supplied Material	$ -				
1210	---	Direct Purchase (vehicle, tools, etc.)	$ -				
---	---	Total Materials & Supplies	$ -				
		Outside Services					
1232	200	Planning	$ -				
1232	201	Design	$ 85,000.00				
1232	202	Electrical Engineering	$ -				

1232	203	Geotechnical Engineering	$ -				
1232	204	Surveying	$ -				
1232	205	Instrumentation & Control	$ -				
1232	206	Easement/Escrow Assistance	$ -				
1232	207	Hydrogeological Engineering	$ -				
1232	208	Construction Management	$ -				
1232	209	Permitting Assistance	$ -				
---	---	Total Services	$ 85,000.00				
		Privileges & Permits					
1240	104	Privileges & Permits	$ 15,000.00				City of LA Permit and fees
							And City of CC Permit
		Law Expenditures					
1247	---	Law Expenditures	$ -				
		Rents					
1255	---	Rents	$ -				
		Special Machine Service					
1226	---	Owned	$ -				
1244	---	Rented	$ -				
		Transportation					
1225	---	Transportation	$ -				
		Total Installation					
---	---	Sub Total-Installation	$ 701,995.00				
		Project Contingency					
---	---	Project Contingency	$ 35,099.75			5.00%	
---	---	General Overhead	16%				
---	---	Total Installation	$ 855,398.46				
		Cost of Removal (exapand as needed for estimating)					
---	---	Flow Meters, Dia, $/inch	$ -	0		$ -	
---	---	BFV's	$ -	0		$ -	
---	---	Gate Valves	$ -	0		$ -	
1253	---	Total Cost of Removal	$ -				
---	---	**Project Cost Estimate**	**$ 855,398.46**				

Cost Estimate

	Date	**3/26/2020**		
	Work Order No.	**25031938**		
	Funding Project No.:	**2471954-04**		
	Project Name:	**129th Well #2**		

Object	Subsidiary	Components of Construction Work	Estimate	%
		Internal Labor - RT		
1221	103	Operations Support	$ 31,000.00	
1221	105	General & Administrative	$ 32,000.00	
1221	200	Planning	$ 357.88	
1221	208	Construction Management	$ 32,000.00	
---	---	Sub-Total	$ 95,357.88	
1224	---	IT&T - Labor Burdens	$ 57,214.73	**60%**
---	---	**Total Internal Labor**	**$ 152,572.61**	
		Transportation		
1225	---	**Transportation**	**$ 750.00**	
		Contract Work		
1231	---	Design/Construction - Pacific Hydrotech Contract	$ 1,859,600.00	
1231	---		$ 97,626.35	
1231	---		$ 15,000.00	
1231	---	**Total Contract Work**	**$ 1,972,226.35**	
		Outside Services		
1232	200	Planning	$ 36,940.00	
1232	208	Construction Management	$ 3,500.00	
		Total Outside Services	**$ 40,440.00**	
		Other Miscellaneous		
1250	---	**Other Miscellaneous**	**$ 37.01**	
		Sub Total-Installation		
---	---	**Sub Total-Installation**	**$ 2,166,025.97**	
		Project Contingency		
---	---	**Project Contingency**	**$ 86,640.04**	4.0%
		Overhead		
1292	---	**General Overhead**	**$ 295,099.25**	**13.1%**
		Total Work Order		
---	---	**Total Work Order (Estimate)**	**$ 2,547,765.25**	

Cost Estimate

	Date:	**3/26/2020**			
	Work Order No.	**25031934**			
	Funding Project No.:	**2471954-06**			
	Project Name:	**Belhaven Wells No. 3 & 4 - AOP**			

Object	Subsidiary	Components of Construction Work	Estimate	%	Comments
		Internal Labor - RT			
1221	103	Operations Support	$ 23,000.00		
1221	104	Priviliges and Permitting			
1221	105	General & Administrative	$ 12,000.00		
1221	106	Construction by GSWC labor			
1221	200	Planning	$ 600.00		
1221	208	Construction Management	$ 23,999.00		
---	---	Sub-Total	$ 59,599.00		
1224	---	IT&T - Labor Burdens	$ 35,759.40	**60%**	
---	---	**Total Internal Labor**	**$ 95,358.40**		
		Transportation			
1225	---	**Transportation**	**$ 500.00**		
		Contract Work			
1231	---	Design/Construction			
1231	---		$ 1,889,300.00		Pacific Hydrotech
1231	---		$ 90,000.00		Blue in Green COR
1231	---		$ 15,000.00		Backwash Tank
1231	---	**Total Contract Work**	**$ 1,994,300.00**		
		Outside Services			
1232	200	Planning	$ 26,000.00		
1232	208	Construction Management	$ 20,000.00		
		Total Outside Services	**$ 46,000.00**		
		Sub Total-Installation			
---	---	**Sub Total-Installation**	**$ 2,136,158.40**		
		Project Contingency			
---	---	**Project Contingency**	**$ 85,446.34**	4.0%	
		Overhead			
1292	---	**General Overhead**	**$ 291,030.22**	**13.1%**	
		Total Work Order			
		Total Work Order (Estimate)	**$ 2,512,634.96**		